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LOAD SETTLEMENT BEI AVIOUR OF SOFT MARINE CLA\ TREATED WITH METAKAOLIN AND CALCIUM CHLORIDE

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ABSTRACT: A developing country like India has to show its development by leaps and bounds in the fields of infrastructure development, transportation and communication system. The peninsular India is having a lengthy coastal belt of around 7700km, except north all three sides of India is surrounded by Bay of Bengal in the east, Indian Ocean in the south and Arabian Sea on the west. The areas surrounded by the coast are being utilized since ages. So, inevitably several national and international authorities are doing Research and Development on coastal structures. The various potential problems associated with this marine clay are land slippage slope stability, poor foundation support and poor drainage. Owing to such soils of poor engineering properties a great diversity of ground improvement techniques such as soil stabilization and chemical treatment are employed to improve their mechanical behavior, thereby enhancing the reliability of construction. Metakaolin is applied in soil stabilization for foundations or road Subgrade. However, Metakaolin along with Calcium Chloride treatment for these poor soils, as an alternative to the traditional "remove and replace" strategies commonly utilized was found to be satisfactory in the laboratory evaluation. Hence the authors arrived at an optimum content of Metakaolin mixed to soft marine clay and then further it is chemically treated with calcium chloride. The optimum dosage of calcium chloride in combination with the optimum content of Metakaolin was evaluated from the tests conducted in the laboratory. Further the authors studied the performance of soft marine clay beds prepared with different alternative treatments by conducting load tests in the laboratory. The test results indicated that the load carrying capacity of the Metakaolin treated marine clay bed was improved and further it was increased by chemical treatment with calcium chloride.

Key words: Marine clay, Stabilization, Chemical treatment, Metakaolin, Calcium chloride

1 INTRODUCTION

Soft clays are highly compressible and undergo large deformations under little superimposed loads, under undrained and drained conditions. Presence of poor subgrade conditions are the major causes of pavement failures and soft clays subgrade is one such problematic situation. In many civil engineering constructions, soft and weak soils are often stabilized with ordinary Portland cement (OPC) and lime. The manufacture processes of conventional stabilizers are energy intensive and emit a large quantity of CO_2. It has been found that the beneficial properties of metakaolin (MK) may be used in improving the mechanical properties of soils .and can be used as structural material (Konstantinos G. Kolovos et.al., 2013). In this study, a weak marine clay was stabilized with metakaolin (MK)+calcium chloride($CaCl_2$) with its high strength, low cost, low energy consumption and less CO_2 emissions during production. The properties of lateritic soil can be improved by adding metakaolin for barrier system for the containment of municipal solid waste (Umar et.al., 2015). The strength, stiffness, and ductility of the soil were improved after the stabilization with metakaolin based geopolymer, also the shrinkage of the soil was reduced (MoZhang et.al.,) Metakaolin is an effective agent for cemented soils, the addition of MK mainly changes the pore volume distribution and produces more CSH/Afl/CASH bonding and fissures (ZhangTongwei et.al.,) Metakaolin was beneficial in decreasing the leaching of heavy metals (M.Cyr et.al.,) MK effectively decreases the hydraulic conductivity of cemented soils, addition of .MK leads to less total porosity and throat pore diameter (Yongfeng Deng et.al.,).

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A STUDY ON CONSTRUCTION OF PREFABRICATED BUILDING COMPONENTS USING FLY ASH

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Abstract : Now a days there is great boom in infrastructural development in the form of fast track construction. As an effective strategy for improving the productivity of the construction industry, prefabricated construction has attracted concerns worldwide. In today's world, where speed and convenience play a big part in influencing the use of any product, the age of prefabricated housing products seems to have finally arrived. The usefulness of these products help significantly in speeding up construction by offering ready-to-install building elements such as blocks, joist beams, roof blocks and panels is being widely recognized in the industry. Pre-fabricated components are becoming immensely popular due to the several attractive advantages that they offer, such as off-site fabrication, which allows reduction in construction time and this function helps greatly in managing the schedule of the construction project. Due to their low density, the pre- fabricated components impose a relatively lighter load on the structure and superior quality can also be achieved as these components are manufactured under a strictly controlled environment. In recent times few innovations in the field of materials are expected to make these products even more popular, user friendly and eco-friendly. The present paper discusses on the manufacturing of prefabricated building components using fly ash, and explains regarding fabrication, centering, placing, applications and the advantages over the monolithic construction.

Keywords - Prefabrication, Material, Construction industry, Fly ash.

I. INTRODUCTION

1.1 Prefabrication:

"Prefabrication" is the manufacture of an entire building or components cast in a factory or on site before being placed in position, assembling the structural units so that they can be easily and rapidly erected. Prefabricated buildings are pre-cut, pre-drilled, and pre-engineered before the actual building is constructed. Prefabricated Structures (PFS) are useful for sites, which are not suitable for normal construction methods such as hilly regions, and also when normal construction materials are not easily available. Structures which are used repeatedly and can be standardized such as mass housing, storage sheds, godowns, shelters, bus stands, security cabins, site offices, foot over bridges, road bridges, concrete building blocks etc., are prefabricated structures. This paper discussing about the mix proportions of the materials to manufacture the prefab components and the construction procedure for an ordinary single story residential building.

1.2 Criteria for selection of prefab in India:

In India, the technology adopted for housing components should be of the order that, the production and erection technology be adjusted to suit the level of skills and handling Facilities available under metropolitan, urban and rural conditions. In other words, the structural systems and components selected should ensure minimum material Utilization with maximum structural advantage. However, the component and systems so designed are to be manufactured and erected by manual means in villages, semi mechanical techniques in towns and more or less fully mechanical operations in the metropolitan cities. In urban areas, the concentration of construction activity does not justify prefabrication.

A wide variety of roofing methods to suit these requirements have been developed and used on mass scale in many housing projects such as funicular shell, cored slabs, RCC channel units, precast cellular units, precast RC planks and joists, prefab brick panels and joists, RCC joists and hollow concreteblocks.

1.3 Material used for Prefabrication:

Prefabricated components can be manufactured using many materials, depends up on the type of structure. Generally materials used are Wood, Steel, concrete, plastic and composite materials .If the structure is wooden house then prefabricated woodenpanels, columns, posts are used. If the structure is prefabricated steel truss bridge then steel members like angles, I, L-sections and rives, bolts are used. If the structure is houses in developed countries then the prefabricated plastic internal partition walls, doors, panels and toilets are used. The man made rock concrete is also widely used for the manufacturing of the prefabricated

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EXPERIMENTAL STUDIES ON STRENGTH CHARACTERISTICS OF CONCRETE WITH WASTE PAPER SULDGE ASH AS PARTIAL REPLACEMENT FOR CEMENT

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Abstract : Cement manufacturing industry is one of the carbon dioxide emitting sources besides deforestation and burning of fossil fuels and concrete industry is one of the largest consumers of natural virgin materials. The global cement industry contributes about 7% of greenhouse gas emission to the earth's atmosphere. In order to address environmental effects associated with cement manufacturing and constantly depleting natural resources, there is a need to develop alternative binders to make concrete industry sustainable. In order to make it, the use of waste materials in place of natural resources is one of the best approaches. Paper mill sludge is a major economic and environmental problem for the paper and board industry. In India, 0.7% of total urban waste generated comprises of paper sludge. It has an energy content that makes it a useful candidate as an alternative fuel for the manufacture of Portland cement. This work examines the possibility of using waste paper sludge ash as partial replacement of cement for new concrete. In this study waste paper sludge ash was partially replaced as 5%, 10%, 15% and 20% in place of cement in concrete for M-20 mix and tested for its compressive strength, tensile strength, water absorption and dry density up to 28 days of age and compared with conventional concrete. From the results obtained, it is found that Waste Paper Sludge Ash can be used as cement replacement up to 10% by weight and particle size less than 90μm to 4 prevent decrease in workability. Further waste paper sludge has very high calorific value and could be used as a fuel before using its ash as partial cement replacement.

Key terms **- Sustainability, Industrial wastes, Waste Paper Sludge Ash.**

I. INTRODUCTION

Although cement constitutes only about 10 per cent of the volume of the concrete mix, it is the active portion of the binding medium and the only scientifically controlled ingredient of concrete. Identifying a waste that resembles the properties close to that of cement and establishing their utility for partial use in cement is essential. As wastepaper sludge ash contains higher percentage of silicon dioxide SiO2, it may provide extra strength to concrete. The present study is aimed at developing a concrete using the waste paper sludge ash, an industrial waste of paper mills as a partial replacement material for cement. This not only reduces the cost of construction but also helps to beat the environmental problems of the region associated with disposal of waste paper sludge.

II. LITERATURE REVIEW

A. GENERAL

Based on several experimental studies have been carried out on the concrete by the partial replacement of cement with Paper Sludge Ash. Strength parameters such as compressive strength, tensile strength and flexural strength were studied and obtained test results will be compared with the conventional concrete. The main aim of this section is to present an overview of research work carried out by various researchers in the field of Waste paper sludge ash.

B. STUDY ON CONCRETE PROPERTIES USING WASTE PAPER SLUDGE AS PARTIAL REPLACEMENT OF CEMENT AND ALSO OTHER AGGREGATES

- Parviz et al (1994) proffered the durability and moisture effects on waste paper – fiber – cement composites. They posited that the increase in the moisture content of virgin and recycled composites reduced the flexural strength and stiffness while it increases the toughness of the composites. The effects of long-term immersion in hot water on the flexural strength, stiffness and toughness of recycled composites were not statistically significant at 95% level of confidence. The flexural stiffness of virgin and recycled composites was affected differently by this ageing process. Also, they reported 30% replacement of cement with silica fume in recycled fiber and that cement composites appeared to be highly effective in controlling the aging mechanisms and moisture effects. This approach presents a practical, economic and efficient way of enhancing the durability and moisture resistance of waste paper – fiber – cement composites.
- Ahmadi et al (2001) reported the results of an investigation on the utilization of paper waste sludge obtained from a paper manufacturing industry, as a replacement to the mineral filler material in various concrete mixes. The physical and

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COMPARATIVE ANALYSIS OF A, E SHAPED BUILDINGS USING STAAD.Pro

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Abstract: Different shapes can be adopted in the Building construction. Different shapes of Buildings will behave differently. It depends on shape of the structure, load applied, area of cross sections, quality of materials, etc. In this Project, A- shaped Building (G+4) and E shaped Building (G+4) were taken. Plans and designs of both the Buildings were made using Staad.Pro Software. From the obtained results, Section Displacements, shear forces and bending moments were compared for both the Buildings. And we found that, the E- shaped Building is best.

Keywords - A- shaped Building (G+4) and E shaped Building (G+4), Staad.Pro Software. Section Displacements, Shear forces and Bending moments.

I. INTRODUCTION

1.1 Shape of a Building:

Shape of a Structure plays a vital role in terms of displacements, shear forces, bending moments, etc. Shape of structure can be decided by land area available, Architectural design, etc. Both Regular and irregular shapes are adopted in India. Plan irregular, stiffness irregular and mass irregular buildings were adopted nowadays in some areas of India due to emergency conditions. .

1.2 Data taken:

Shape of Beams = Rectangle
Shape of Column = Rectangle
Size of Beams = 0.35m*0.30m
Size of Column = 0.35m*0.30m
Area of site = 120sq.m
Thickness of Slab = 150mm
Factor of safety = 1.5
f_{ck} = 20N/mm^2
f_Y = 415N/mm^2(main)
f_Y = 250N/mm^2(secondary)
Percentage steel = 3%
Number of floors = G+4
Shapes of Buildings = A, E
Dead load = 12KN/m
Live load = 2 KN/m^2

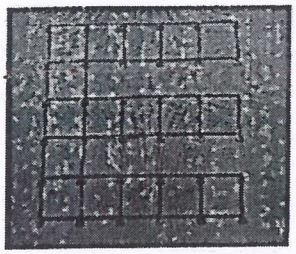

Fig 1.1 Plan of E-shaped Building

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SEISMIC ANALYSIS OF REGULAR AND IRREGULAR BUILDINGS WITH VERTICAL IRREGULARITY USING STAAD.Pro

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Abstract-

This analysis aims to the seismic response of various vertical irregularity structures. This project is done by Response spectrum analysis. This study includes the modeling of Regular and H-shape plan irregular Building. The main aim of this project is comparative study of the stiffness of structure by considering three models in Regular and three models in Plan Irregular structures with different vertical irregularities. Seismic zone V is considered. Results said that displacements are more for Irregular structures when compared to Regular structures. Staad.Pro software is used for the analysis. Node displacements, time period, frequency and Base shear are determined. The performance of some Irregular Buildings is better than Regular buildings.

Keywords*: *STAAD Pro, Irregular Buildings, Regular buildings, Node displacements, time period, frequency Base shear, Response Spectrum Analysis

1.1 INTRODUCTION

Earthquake is defined as shaking of the ground produced by forces called seismic forces. This vibration causes the shaking of buildings causing mild to severe damages to buildings leading to loss of human life. Recently severe earthquakes have devastated many places and heavy loss of life. This has led to a detailed study of structures. Earthquake means the sudden vibration of earth which is caused by naturally or manually. An Earthquake is characterized as the sudden movement of Earth's crust. Earthquakes are caused by the release of build-up stress within rocks along geological faults or by the movement of magma in volcanic territories. Major earthquakes usually do not occur alone when one such earthquake happens there is usually another one at the nearby location. There are smaller earthquakes that occur in the same place before the larger earthquake follows. It causes various damaging effects at places they act. It causes severe damage to the buildings and great loss of life. Hence buildings under seismic prone regions should be designed such that it resists the earthquake without any failure. The sites which are nearer to the fault line are highly affected than the sites which are located far from the fault line.

Fault: A fracture having significant movement in parallel with its plane is known as fault. The energy released during the quick slippage of faults results in earthquakes.

Near Field: The field or site which is in the range of 10km to 15km from the fault line is called as near field.

Far Field: When the distance of site or field is more than 20km from the fault line then it is called as Far Field.

The near field earthquake contains high frequency, long period, large amplitude pulses and higher accelerations when compared to far field ground motions. From the fluctuating nature of near field, evaluation of structural response is difficult. They are denoted by simple analogous pulse models of simplified motions composed of important near field aspects for their simplification. Researchers studied for earthquakes since long time and still the earthquakes are unpredicted. It is impossible to predict time and place of earthquake. To design and construct the structure which can withstand against earthquake is research interest since last many years, also researchers required to measure the frequency and intensity of earthquake for future structural design. Safety, strength and performance are the parameters which are to be considered while designing structure in seismic zones specially. However codes and guidelines are prepared by engineering societies in world which can be used to design buildings.

The frequency, type and magnitude of earthquakes experienced over a period of time define the seismicity (seismic activity) of that area. The observations from a seismometer are used to measure earthquake. Earthquakes greater than approximately 5 are

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Software adaptive model analysis of steel Bridge

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Abstract

Urbanisation requires the need for rapid improvement in the transportation facilities to transport commodities, livestock and goods at faster pace. In order to accommodate this there is an imperative requirement to have short routes connecting the inaccessible areas through obstacles like valleys, rivers etc., and bridging gaps between them by adopting effective methods and by constructing efficient structures to minimize cost, weight, construction time , labour and to maximize the efficiency of the structure. Among all the bridges, steel bridges play a major role in providing enough strength and rigidity satisfying the deflection limits. Hence in order to achieve this, it is necessary to carry out an accurate analysis to investigate the reactions and stresses in the elements of the bridge. This project looks into the concepts and procedure of the parametric investigations and designs of the steel trusses using software's available as they give more reliable results and can provide variable ways of analysis simultaneously.

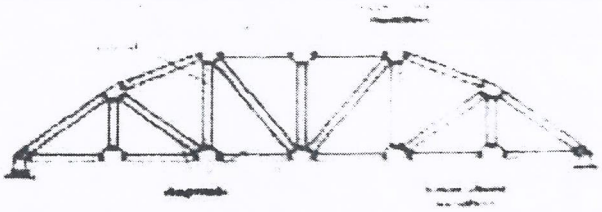
Keywords: ANSYS ,steel bridge, steel struss, efficient structures ,etc,

1. Introduction

TRUSS

A truss is a structure that acts like a beam but with major components, or members, subjected primarily to axial stresses. The members are arranged in triangular patterns. Ideally, the end of each member at a joint is free to rotate independently of the other members at the joint. If this does not occur, secondary stresses are induced in the members. Also if loads occur other than at panel points, or joints, bending stresses are produced in the members.

Though trusses were used by the ancient Romans, the modern truss concept seems to have been originated by Andrea Palladio, a sixteenth century Italian architect. From his time to the present, truss bridges have taken many forms. Early trusses might be considered variations of an arch. They applied horizontal thrusts at the abutments, as well as vertical reactions, In 1820,Ithiel Town patented a truss that can be considered the forerunner of the modern truss. Under vertical loading, the Town truss exerted only vertical forces at the abutments. But unlike modern trusses, the diagonals, or web systems, were of wood lattice construction and chords were composed of two or more timber planks.



components in trusses

Joints are intersections of truss members. Joints along upper and lower chords often are referred to as panel points. To minimize bending stresses in truss members, live loads generally are transmitted through floor framing to the panel points of either chord in older, shorter-span trusses. Bending stresses in members due to their own weight was often ignored in the past. In modern trusses, bending due to the weight of the members should be considered. Chords are top and bottom members that act like the flanges of a beam. They resist the tensile and compressive forces induced by bending. In a constant-depth truss, chords are essentially parallel.

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Experimental investigation on mechanical properties of geopolymer concrete with Magnetized water

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Abstract:

It is expected that in upcoming days, the community of civil engineering have to produce structures with the concept of sustainable development by using high-performance materials and new concept with low environmental impact, which are produced at a reasonable cost. However, with development of population pollution level and impact of pollution on human life and human health are also increasing. Cement production is one of the main components of pollution by releasing CO2 emissions in to the atmosphere. It is nearly 7% of the world's carbon oxide emission. Geopolymer concrete is one of the green building material in order to create the more sustainable world using industrial waste by replacing cement but also it maintain it state, workability and properties. As the Magnetic water concrete, synthesized from the normal materials used for manufacturing of concrete which provides increasing extra strength and workability to concrete, provides one route towards this objective. Good thing is normal water can easily replace with magnetic water and this additional strength by usage of magnetized water can be used to reduce the usage using of geoplolymer materials. Using of geoplolymer materials by which quantity of cement in any concrete mix reduces and we can made as new Eco-friendly material of construction for future. The present research work is carried out to investigate the effect of magnetic water on the Compressive Strength, Split Tensile Strength and Flexural Strength properties of geoplolymer concrete..

Keywords :compressive strength, split tensile strength, flexural strength geopolymer concrete etc,.

1. Introduction

Concrete is made of Portland cement, water, cement substitutes and aggregates. Portland cement is hydraulic cement that hardens in water to form a water-resistant compound. The hydration products act as binder to hold the aggregates together to form concrete. The setting and hardening of concrete are the outcome of chemical and physical developments that take place between Portland cement and water called hydration. This hydration reaction is an exothermic reaction, which liberates large quantity of heat, and this is to be dissolute for continuing hydration process. Many types of concrete are available, distinguished by the proportions of the main ingredients. In this way or by substitution for the cementitious and aggregate phases, the finished product can be tailored to its application. Strength, density, as well as chemical and thermal resistance are variables. Aggregate consists of large chunks of material in a concrete mix, generally a coarse gravel or crushed rocks such as limestone, or granite, along with finer materials such as sand. Cement, most commonly Portland cement, is associated with the general term "concrete.

Advantages of concrete

- Ingredients of concrete are easily available in most of the places.

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A Study on Mechanical Properties and Stress Strain Behaviour Of ConcreteContaining Plastic Waste

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Abstract

Now a day's one of the major problems in construction industries is insufficientand unavailability of construction materials, on the other side the main environmentalproblem is the disposal of the waste plastics. In this experimental study, an attempt hasbeen made to use the plastics in concrete and studies have been conducted to focus on the behaviour of flexural and compression members under various proportions of plastics.Two types of plastics namely polythene sheets and plastic straws were selected andmixed with concrete in various proportions (0.5% ,1.0% & 1.5%).The specimens werecasted and tested for its flexural and compression strength respectively. Among the two types of plastic products used, polythene sheets were found to give better results incompression, flexural & tensile strength. The Indian concrete industry is today consumingabout 400 million tonnes of concrete every year and it is expected, that this may reach abillion tones in less than a decade. All the materials required to produce such huge quantities of concrete, come from the earth's crust, thus depleting its resources every yearcreating ecological strains. On the other hand human activities on earth produce wasteplastics. The use of plastics in various places as packing materials and the products such asbottle, polythene sheet, containers packing strips etc,. are increasing day by day. Thisresults in production of plastic waste from all sort of livings from industrial manufacturers to domestic users. So, we are in need to search for new construction materials as well as a method to dispose the plastic waste.

Keywords: plastics, compressivestrength, flexural and compression members etc.

1. Introduction

Concrete is a composite material composed mainly of water, aggregate, andcement. Often, additives and reinforcements are included in the mixture to achieve thedesired physical properties of the finished material. When these ingredients are mixedtogether, they form a fluid mass that is easily moulded into shape. Over time, thecement forms a hard matrix which binds the rest of the ingredients together into a durable stone-like material with many uses Famous concrete structures include theHoover Dam, the Panama Canal and the Roman Pantheon. The earliest large-scaleusers of concrete technology were the ancient Romans, and concrete was widely usedin the Roman Empire. The Colosseum in Rome was built largely of concrete, and theconcrete dome of the Pantheon is the world's largest unreinforced concrete dome.After the Roman Empire collapsed, use of concrete became rare until the technology was re-pioneered in the mid-18th century. Today, concrete is the most widely usedman-made material (measured by tonnage)

MERITS AND DEMERITS OF CONCRETE

Some Merits of concrete are given below in brief.

1) Concrete is economical when ingredients are readily available.

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Effect of characteristic compressive strength of concrete by replacing cement partially with hypo sludge

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Abstract:

hypo Sludge is a waste produced in the paper manufacturing industry. Paper mills generate more than 4 million tons of sludge each year for disposal. Hypo Sludge is known to contain useful fibers and chemicals, as my project to get good results by adding of ferrous oxide to the hypo sludge to the fly ash improve the strength, durability, and life span of concrete structures exposed to weather. Paper making generally produces a large amount of solid waste. Paper fibers can be recycled only a limited number of times before they become too short or weak to make high quality paper. It means that the broken, low-quality paper fibers are separated out to become waste sludge. All the inks, dyes, coatings, pigments, staples and "stickiest" (tape, plastic films, etc.) are also washed off the recycled fibers to join the waste solids. The shiny finish on glossy magazine-type paper is produced using a fine kaolin clay coating, which also becomes solid waste during recycling. This paper mill sludge consumes a large percentage of local landfill space for each and every year. Worse yet, some of the wastes are land spread on cropland as a disposal technique, raising concerns about trace contaminants building up in soil or running off into area lakes and streams.

Some companies burn their sludge in incinerators, contributing to our serious air pollution problems. To reduce disposal and pollution problems emanating from these industrial wastes, it is most essential to develop profitable building materials from them. Keeping this in view, investigations were undertaken mix. Concrete mixtures were produced, tested and compared in terms of compressive strength, durability& life span to the conventional concrete. These tests were carried out to evaluate the mechanical properties. For the test results for compressive strength up to 56 days are taken. This experimental investigation on strength of concrete and optimum percentage of the partial replacement by preparing a mix M40 grade was designed as per Indian Standard method and the same was used to prepare the test samples. The design mix proportion used were Conventional Concrete, 10%, 20%, 30%, 40% replacement of cement by industrial waste like fly ash and hypo sludge. In the test performed, the optimum compressive stress obtained by utilizing paper waste was at 30% replacement. At the place where strength is not of more importance or rather structure is for temporary basis then design mix proportion up to 40% replacement can also be utilized. Test also point towards developing low cost concrete by varying design mix proportion from 10%replacement to 40%replacement. The compared values of cost show gradual decrement in total cost of per cubic meter concrete. When government implement the projects for temporary shelters for who those affected by natural disaster, this material can be used for economic feasibility. To investigate the utilization of Hypo Sludge and fly ash as Supplementary Cementations Materials (SCM) and

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DETERIORATION OF CONCRETE DUE TO ACID ATTACK

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Abstract:

A developing country like India has to show its development rapidly in the fields of infrastructure development, transportation and communication systems. The peninsular India is having a lengthy costal belt of around 7700 kms .the area surrounded by the cost are being utilized since ages. So inevitably, several national and international authorities are doing research and development on costal structure potential problems associated with these costal structures is acid attacks. Infrastructure facilities are developing day by day. Acid attacks the concrete and deteriorate it in many ways as corrosion, leaching etc. The increase in the concentration of acid content is directly proportional to the performance of the concrete. Concrete gets changes in its properties like compressive strength, flexural strength and split tensile strength. Now by taking into account of acid attack we have done an experimental study to know the performance of concrete when the powerful acids HNO3 NITIC ACID and HCL HYDROCHLORIC ACID attack it. We have studied the various strength properties of concrete at different concentration of acids, discussed the results and conclusions are drawn.

Keywords: *HNO_3 , NITIC ACID,HCL HYDROCHLORIC ACID ,compressive strength, flexural strength.*

1. Introduction

Concrete is a composite material composed of coarse aggregate bonded in to be shared mutually by fluid cement that hardens done in time. Maximum concretes usage are lime-based concretes ,for example, Portland cement concrete or concretes complete by other cement, for example ,for example, cement fondue. However, asphalt concrete, that is frequent usage for road surfaces, is too a type of Concrete, where the cement material is bitumen, and polymer concretes are usage where the cementing material is a polymer. After aggregate is mixed together with dry Portland cement and water, the Mixture forms a fluid slurry i.e. easily poured and molded into shape. The cement performs responds chemically by the water and other ingredients to form a hard matrix that binds the materials together into a durable stone-like material that has several usages. Frequent, additives (for example perhaps pozzolans or super plasticizers) are included in the mixture to improve the physical properties of the wet mix or the finished material. Maximum concrete is poured by reinforcing materials (for example rebar) embedded to provide tensile strength, yielding reinforced concrete. Famous concrete structures include the Hoover Dam, the Panama Canal, and the Roman Pantheon. The initial large-scale usages of concrete technology were the ancient Romans, and concrete stood extensively usage in the Roman Empire.

The Colosseum in Rome stood built largely of concrete, and the concrete dome of the Pantheon is world's largest unreinforced concrete dome. Nowadays, large concrete structures (perhaps, dams and multi-story car parks) are usually complete by reinforced concrete. After the Roman Empire collapsed, usage of concrete became rare until the

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Seismic retrofit of reinforced concretebuildings using jacketing

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Abstract:

Many parts of the country have suffered earthquake in last three decades. In costalpart of South India faced Tsunami. In first three earthquakes it was found that many ofdamaged structures were build in non-engineered masonry techniques.Unreinforced masonry structures are the most vulnerable during an earthquake.Normally they are designed for vertical loads and since masonry has adequate compressivestrength, the structures behave well as long as the loads are vertical. When such a masonrystructure is subjected to lateral inertial loads during an earthquake, the walls develop shearand flexural stresses.In previous earthquakes many R.C.C buildings have also collapsed and are found unsafe due to faulty workmanship. Many other causes are responsible for major collapse anddamage to the R.C.C structures. This thesis presents a study of PL+SC+S+G+5 storeybuilding, where this PL+SC+S+G+5 storey residential building is being converted tocommercial building which results increase of live load in existing building This overallanalysis is done by using ETABS software . we follow the technique of retrofitting byjacketing method to increase resistance of the building towards lateral forces.

Keywords: PL+SC+S+G+5 story, ETABS, dead loads, live loads ,retrofitting, jacketing etc,.

1. Introduction

When the normal residential building is being change to general commercial buildingthat gives results in increasing the live load in existing building, this was proven in physicaland experimental investigations also. It was concluded that the buildings either should bedemolish or at least should be redefined with suitable techniques, to increase its service life. This can be overcome by new technique called retrofitting by jacketing. It was decided to implement reinforced cement concrete column jacketing technique due to its feasibility and ease for execution of the existing building. All the columns and beams on all the floors are now suitably jacketed. The loose pockets of concrete that were investigates during the test are re-concreted, and rusted the reinforcement is replaced with new reinforcement as per thegiven design requirements.

Redefining utilizes the concepts of confinements by strengthen the existing beam orcolumn with external pressures. Confinement in reinforced concrete also uses the lateralsteel reinforcement to delay the lateral expansion of the confined concrete. This is known as The concrete core. While strengthening the longitudinal steel and reinforcement by braceincreasing and its buckling strength. Certain reinforcement concrete columns are alsodesigned and utilizing the concept of confinement with steel rebars hoops or spirals insidethe concrete core. The need for additional confinement is sometimes necessary. It is alsoimportant to know the how new retrofit material will enhance and strengthen the existingmember.

Objectives

So many researchers have been developed equations and models to predict thebehavior of the reinforced concrete columns confined with steel rebars, the

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Experimental Study On Self Compacting Concrete Using Industrial By-Products

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Abstract :

A self-compacting concrete (SCC) is the one that can be placed in the form and can go through obstructions by its own weight and without the need of vibration. Since its first development in Japan in 1988, SCC has gained wider acceptance in Japan, Europe and USA due to its inherent distinct advantages. The major advantage of this method is that SCC technology offers the opportunity to minimize or eliminate concrete placement problems in difficult conditions. It avoids having to repeat the same kind of quality control test on concrete, which consumes both time and labor. Construction and placing becomes faster & easier. It eliminates the need for vibration & reducing the noise pollution. It improves the filling capacity of highly congested structural members. SCC provides better quality especially in the members having reinforcement congestion or decreasing the permeability and improving durability of concrete. The primary aim of this study is to explore the feasibility of using SCC by examining its basic properties and durability characteristics i.e. water absorption, shrinkage, and sulfate resistance. An extensive literature survey was conducted to explore the present state of knowledge on the durability performance of self-consolidating concrete. However, because it usually requires a larger content of binder and chemical admixtures compared to ordinary concrete, its material cost is generally 20-is growing evidence that incorporating high volumes of mineral admixtures and micro fillers as partial replacement for Portland cement in SCC can make it cost effective. However, the durability of such SCC needs to be proven. This research work consists of: (i) development of a suitable mix for SCC that would satisfy the requirements of the plastic state; (ii) casting of concrete samples and testing them for compressive strength, shrinkage, water absorption, sulfate resistance. Local aggregates, cement, admixtures and additives produced by the local suppliers were used by in this work. The significance of this work lies in its attempt to provide some performance data of SCC so as to draw attention to the possible use of SCC.

Keywords: self-compacting concrete (SCC), high-range water reducing admixtures (HRWRS), viscosity enhancing admixtures (VEAs).

1. INTRODUCTION

Self-compacting concrete, also referred to as self-consolidating concrete, is able to flow and consolidate under its own weight and is de aerated almost completely while flowing in the formwork. It

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Experimental investigation on partial replacement of sand and cement with copper slag and dolomite powder

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Abstract

Cement is one of the most important constituents of concrete. Most of the properties of the concrete depend on cement. Cement is manufactured by calcining argillaceous and calcareous materials at a high temperature. During this process, a large amount of CO2 is released into the atmosphere. India is the second largest producer of cement in the world. It is estimated that the production of one ton of cement results in the emission of 0.8 ton of CO_2. The reduction in the consumption of cement will not only reduce the cost of concrete but also the emission of CO2.Common river sand is an expensive cost of transportation from natural sources. Also, large-scale depletion of these sources creates environmental problems. As environmental transportation and other constraints make the availability and use of river sand less attractive, a substitute or replacement product for concrete industry needs to be found. River sand is most commonly used fine aggregate in the production of concrete poses the problem of acute shortage in many areas. In such a situation the dolomite powder and copper slag can be an economical alternative for partial replacement of cement and sand. Coming to dolomite powder which is obtained by powdering the sedimentary been developed forM30 grade using design approach IS for both conventional and dolomite powder, copper slag mixed concrete. Tests were conducted on cubes and beams to study the strength of concrete made of dolomite powder, copper slag concrete, and the results were compared with natural sand concrete. The results show that the strength parameters are better than in dolomite powder, copper slag concrete compared to natural concrete in normal condition.

Keywords:M30 grade, compressive strength, split tensile strength, copper slag ,dolomite power etc,.

1.Introduction

Concrete is one of the most durable building materials and have high compressive strength compared to other building materials. It provides superior fire resistance compared with wooden construction and gains strength overtime. Structures made of concrete can have a long service life. Concrete is widely used material than any other manmade material in the world.Asof2014, about 9.8 billion cubic meters of concrete are made each year, more than one cubic meter for every person on Earth.

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ngineering properties of concrete by partial replacement of ement with fly ash and fine aggregate with foundary sand

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Abstract :

A self-compacting concrete (SCC) is the one that can be placed in the form and can go through obstructions by its own weight and without the need of vibration. Since its first development in Japan in 1988, SCC has gained wider acceptance in Japan, Europe and USA due to its inherent distinct advantages. The major advantage of this method is that SCC technology offers the opportunity to minimize or eliminate concrete placement problems in difficult conditions. It avoids having to repeat the same kind of quality control test on concrete, which consumes both time and labor. Construction and placing becomes faster & easier. It eliminates the need for vibration & reducing the noise pollution. It improves the filling capacity of highly congested structural members. SCC provides better quality especially in the members having reinforcement congestion or decreasing the permeability and concrete. However, because it usually requires a larger content of binder and chemical admixtures compared to ordinary concrete, its material cost is generally 20- 50% higher, which has been a major hindrance to a wider implementation of its use. There is growing evidence that incorporating high volumes of mineral admixtures and micro fillers as partial replacement for Portland cement in SCC can make it cost effective. However, the durability of such SCC needs to be proven. This research work consists of: (i) development of a suitable mix for SCC that would satisfy the requirements of the plastic state; (ii) casting of concrete samples and testing them for compressive strength, shrinkage, water absorption, sulfate resistance. Local aggregates, cement, admixtures and additives produced by the local suppliers were used by in this work. The significance of this work lies in its attempt

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Pushover Analysis of Multi-Storeyed Concrete Building with and Without Shear Wall UsingEtabs Software

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Earthquake, a natural fury cannot be ignored as far as the stability of a structure is concerned. All structures should be made seismic resistant to prevent loss of life and infrastructural damage. The Pushover Analysis is conducted to find out the seismic response of the structure In performance based seismic analysis evaluates how building is likely to perform. It is an iterative process with selection of performance objective followed by development of preliminary design, an assessment whether or not the design meets the performance objective: In the present study pushover analysis has been done an two multistoried R.C. frame building: In which plan of 2 buildings was taken symmetrical 10 storey and it consist of 5 bays in x direction & 5 bays in y direction and second building having 15 storey. The shear wall is providing for studying their resisting lateral forces. The building has an overall plan dimension of 20m x 20m.The M25 grade of concrete and Fe 415 grade of steel is considered for design. In this highlight the effect of shear wall on R.C frame building when shear wall providing along the longer and shorter side of the building Pushover analysis is carried out using commercially available software ETABS and behaviour of RC frames is studied.

Key words: *Pushover analysis, Capacity M25, shear wall, ETABS software.*

1 Introduction

Seismic analysis is a subset of structural analysis and is the calculation of the response of a building (or non-building) structure to earthquakes. It is part of the process of structural design, earthquake engineering or structural assessment and retrofit in regions where earthquakes are prevalent.As seen in the figure, a building has the potential to 'wave' back and forth during an earthquake (or even a severe wind storm). This is called the 'fundamental mode' and is the lowest frequency of building response. However, most buildings have higher modes of response, which are uniquely activated during earthquakes. The figure just shows the first and second mode, but there are higher 'shimmy'

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ANALYSIS AND DESIGN OF DOUBLE LANE ROAD BRIDGE

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ABSTRACT

A Bridge is a structure providing passage over an obstacle without closing the way beneath. The required passage may be for a road, a railway, pedestrians, a canal or a pipeline. The obstacle to be crossed may be a river, a road, railway or a valley. In other words, bridge is a structure for carrying the road traffic or other moving loads over a depression or obstruction such as channel, road or railway. A bridge is an arrangement made to cross an obstacle in the form of a low ground or a stream or a river without closing the way beneath. In this study, a Double lane road bridge is proposed at any road crossings of irrigation Canal Bridge is a structure having a total length above 6 m between the inner faces of the dirt walls for carrying traffic or other moving loads over a depression or obstruction such as channel, road or railway. All these RCC spans will have tar paper bearings. The type plans of MORTH are available at the above interval and if the design span does not exactly match with the available type design, the details of next higher span length be used. These are designed for varying bearing capacity of foundation stratum as per existing ground strata. When the canal is crossing the road or cart track a structure required to cross the canal from one side of canal bank to another side of canal bank then a Double Lane Road Bridge may be proposed.

1.INTRODUCTION

A bridge is a structure built to span physical obstacles without closing the way underneath such as a body of water, valley, or road, for the purpose of providing passage over the obstacle. There are many different designs that each serve a particular purpose and apply to different situations. Designs of bridges vary depending on the function of the bridge, the nature of the terrain where the bridge is constructed and anchored, the material used to make it, and the funds available to build it. The first bridges made by humans were probably spans of cut wooden logs or planks and eventually stones, using a simple support and crossbeam arrangement. A common form of lashing sticks, logs, and deciduous branches together involved the use of long reeds or other harvested fibers woven together to form a huge rope capable of binding and holding together the materials used in early bridges.

When a canal crossing a major road that is District high ways then we are going to propose a structure is called Double Lane Road Bridge under the specifications of IRC standards.

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Mineralogical Study on High Volume Silica Fume Concrete at Elevated Temperatures By Xrd Analysis

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Abstract

Waste disposal is one of the major problems being faced by all the nations across the globe. Silica fume is a byproduct of producing silicon metal or ferrosilicon alloys. One of the most beneficial uses for silica fume is in concrete. Because of its chemical and physical properties, it is a very reactive pozzolanic. Concrete containing silica fume can have very high strength and can be very durable. Silica fume is available from suppliers of concrete admixtures and, when specified, is simply added during concrete production. Placing, finishing, and curing silica-fume concrete require special attention on the part of the concrete contractor. The advancement of concrete technology can reduce the consumption of natural resources and reduce the burden of pollutants on the environment. In this project changes in mechanical and mineralogical properties of high volume silica fume concrete exposed to elevated temperature from 200°C to 800°C at an interval of 200°C for 24hr duration is investigated and compared with conventional concrete. The mechanical properties studied are shows better results than conventional concrete mix. C85S15 concrete mix has attained the higher residual compressive strength than C90S10, C80S20 and conventional concrete (C100) mixes at all temperatures. C80S20 concrete mix shows Lower % Residual strengths at elevated temperatures, So that fire resistance Decreases with increment of Silica fume content. Weight loss is noticed considerably more in conventional concrete mix compared to fly ash concrete mixes. Cracks are observed in all mixes between 600°C to 800°C. XRD results shows, At 400°C Calcite peaks were completely disappeared and it has decarbonated to form free lime and released CO2 gas. Any available sulphate can react with free lime to form anhydrite. Silica fume mixed samples exhibited change in colour from grey to red - Orange between 600°C to 800°C, which is due to possible formation of Fe-silicates/hematite. At 800°C, water is rapidly lost from cementitious gels and any ettringite present. After heating to 800°C,

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Use of Industrial Byproducts as A Sustainable Technique for Strength Improvement of Red and Black Soils Based on Initial Properties

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Abstract: Soil is the irreplaceable element of this nature. The word "soil" is derived from the Latin word "solium". The term soil in soil engineering is defined as an unconsolidated material, composed of solid particles formed by disintegration of rocks. In general, soil is used as a basic construction material. Red soil is formed due to weathering of ancient parent metamorphic rocks and crystalline rocks. 10.6% of the India's territory (about 3.5 lakhs sq.km) is covered by red soil. Red soil can be found in different textures that can vary from clay to sand, mostly in the form of loam. Black soil is a highly expansive soil which expands when it comes in contact with water due to presence of a clay mineral called "Montmorillonite". About 20% (0.8 million sq.km) of Indian land area in India is covered by black soils. This type of soil is available up to a depth of 3.7 meters on an average. These soils are famous for cotton cultivation. These soils have been found to be most troublesome from engineering considerations and poses a challenge to the civil engineers. Chemical stabilization is one of the oldest methods of stabilization of problematic soils. The aim of this project is to determine the index and engineering properties of red soil sample as well as black soil sample and to study and compare the samples thoroughly in all aspects and suggest the most efficient soil in civil engineering point of view. This project presents various laboratory experiments conducted on red and black soil samples respectively; They are: Atterberg Limits, Specific gravity, Grain size analysis (Index properties), Optimum Moisture Content (OMC), Maximum Dry Density (MDD), California Bearing Ratio (CBR), Unconfined Compressive Strength (UCS) and Differential Free Swell Index (DFSI). The results of conducted experiments have shown significant differences between the values for the samples of both red and black soils respectively. From this, we want to conclude by suggesting that virgin red soil is the most suitable and efficient soil when compared with the black soil, while Black soil is the best when replaced with 30%Fly Ash and added by 6%Lime.

KEYWORDS: Atterberg Limits, Black soil, California Bearing Ratio (CBR), Differential Free Swell Index (DFSI), Fly Ash, Grain size analysis, Lime, Red soil, Specific gravity, Standard Proctor Compaction, Unconfined Compressive Strength (UCS).

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Design of Rapid Sand Filters by Capping of Coconut Shell

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Abstract: A study was carried out to determine about the rapid sand filter which are very commonly used in Conventional water treatment plants. The rapid sand filter beds are suffering by the problems like Mud ball formation, unsatisfactory effluent, etc. Dual media and multimedia filters can overcome the limitations of RSF. Capping of crushed coconut shell is used as a Dual Media. Designing Dual media filter capped with crushed coconut shell proves to be more efficient, economical and durable. The sample was collected from nearby lake which was highly turbid and having high amount of total solids. A fabricated model was prepared having dimensions 0.5 x 0.5 x 0.9m. Gravel, Sand, Coconut Shell was filled in the model in the layer of size 20cm, 15cm, and 20cm respectively. The tests which are conducted on the sample are pH, Turbidity, BOD and Total solids. It improves the performance of filter in the terms of high filtration rate, high turbidity removal and high decrease in percentage of total solids and thus making it more applicable. This filter media reduces about 90% of turbidity. The amount of total solids was decreased about 89%.

KEYWORDS: Rapid Sand Filter, Coconut Shell, Filtration, Turbidity, pH, BOD, Total Solids.

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Comparative Study on Replacement of Cement by S.C.B.A (Sugarcane Bagasse Ash) & R.H.A (Rice Husk Ash)

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Abstract: The production of Ordinary Portland Cement(OPC) contributes to the release of harmful greenhouse gases.In an effort to reduce these emissions, this study explores biomass materials to evaluate their use as partial replacements for ordinary Portland cement.Rice husk and sugarcane bagasse are agricultural waste products and large amounts of these are currently landfilled,making them inexpensive and available.When combusted at high temperatures they form rice husk ash and sugarcane bagasse ash with pozzolanic characteristics.The high silicon dioxide levels in these products make them good options to use as partial replacement for OPC.Replacement with20% rice husk ash or 10% sugarcane bagasse ash give similar compressive strength and corrosion resistance for hardened cement paste samples compared to control OPC samples,if appropriate amounts of plasticizer are used.

KEYWORDS: Sugarcane Bagasse Ash, Rice Husk Ash, Pozzolanic Characteristics, Compressive Strength

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Study on Engineering Properties of GGBS and Silica Fume Admixed High Performance Concrete

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Abstract: High performance concrete (HPC) is a concrete meeting special combinations of performance and uniformity requirements. This leads to examination of the various admixtures to improve the performance of the concrete. The usage of mineral admixtures in the concrete not only enhances its strength properties but also durability. To study the role of silica fume and ground granulated blast furnace slag (GGBS) on concrete strength characteristics of a high-strength test program has been planned. Different concrete mixtures were prepared and tested with different levels of cement replacement (0 %, 10 %, 20 %, 30% and 40 %) of GGBS with active silica fume as addition (0 %, 5 %, 10 % and 15 % by weight of cement). The main objective of this study is to determine the optimal replacement percentages that can be appropriately used in Indian conditions. To find the optimal replacement GGBS with the addition of silica fume in M60 grade concrete with maintaining water cement ratio of 0.32. This experiment is planned to compare 7days and 28days the strength parameters of concrete i.e., compressive strength, split tensile strength and flexural strength. And also workability and durability characteristics were examined. Key Words: GGBS, Silica fume, super plasticizer, compressive strength, split tensile strength, flexural strength and High performance concrete.

KEYWORDS: GGBS, Silica fume, super plasticizer, compressive strength, split tensile strength, flexural strength and High performance concrete.

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Construction and Designing of Highways

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Abstract: Nowadays is the world of modern. people is increasing their standards due to the infrastructure. transportation is the major infrastructure which connects all over the world. for transportation facilities road is necessary

Roads are one of the most important parts of the infrastructures and they play a key role in development of the society all around the world. Despite having a crucial part in national economy, road network systems imply high economic burdens on the road agencies. In order to keep the quality of the roads above an acceptable level, large amount of investments for rehabilitation and maintenance activities are necessary. The case of not being able to provide those funds will result in a poor road's safety and operational condition.

Life Cycle Cost (LCC) is the total discounted cost for construction, operation, maintenance,and disposing of a facility during its defined life time. Life Cycle Cost Analysis (LCCA) is an economic evaluation method to obtain the total cost of construction, operation,maintenance, and demolition for a property during its life time [8]. By providing cost estimation over the life time of a project for initial construction cost and all the related costs for rehabilitations and maintenances, LCCA helps the designers, road administrations, and contractors with choosing the most economically efficient design for the roadways. Thus LCCA can be used as a basis for more optimized investments [1]. The American Association of State Highway and transportation Officials of 1986 and 1993 describe the different costs that must be considered in LCCA. The agency and the user costs associated with pavement projects and also economic evaluation methods and discount rate is also discussed in the guide [2]. The center for Transportation Research (CTR) developed the Flexible Pavement System, a methodology and software to compare the total design life costs for different alternatives [4] In order to perform LCC on roads a prediction on the life time of the road, corresponding thicknesses of structural layers as well as the eventual rehabilitations are required. To calculate the asphalt design thickness for an assumed number of years, the Calibrated Mechanistic design (CM) model can be used. This study aimed to develop an approach for performing comparative LCCA in order to find the most economical design alternative in terms of the total cost during the pavement design life. In this approach a LCCA was construction innovation, manufacturing innovation, Road construction, case study, project management,performed based on design predictions by the CM flexible pavement design model.

KEYWORDS:.*construction innovation, manufacturing innovation, Road construction, case study, project management,*

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Experimental Study on Strength Characteristics of Concrete with Waste Paper Sludge Ash as Partial Replacement of Cement

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Abstract: The sludge waste of paper is the main unused product that obtained during the manufacturing process of paper from the paper manufactured industries. From the statistics of world water pollution around 1.2 crore tonnes of waste sludge is disposing every year around the world .In the process of Paper making it produces vast amount of waste in the solid form which contains fibrous material but which cannot be recycled to prepare the good quality of paper so for this reason the manufactures dump this material in nearby water sources or in dumping yards.In this thesis the feasibility of paper sludge using in concrete production as the partial replacement by cement weight In the disaster scenarios government adopted same methodology to prepare the temporary shelter for the emergency services . To investigate the utilization of paper sludge and fly ash as Supplementary Cementations Materials (SCM) and influence of these Paper sludge and fly ash on the Strength of concretes made with different Cement replacement levels and compare with ordinary concrete. Investigate low cost concrete by using Paper sludge and fly ash as Supplementary Cementations Materials (SCM) and compare the cost of each per meter cube. The mix proportions that has been prepared by replacing the cement by paper sludge in the following percentage replacements accordingly in the assortment of 0 %, 10 %, 20 %, 30 % and 40 % by weightiness of cement for M-40 mix. The test results are observed up to 56 days due to involvement of durability and performance

KEYWORDS: Paper Waste Sludge, Hypo Sludge Compressive Strength, Split Tensile Strength, Flexural Strength, Durability and mix design

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Partial Replacement of Cement with Dolomite Powder

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Abstract: Concrete is the most extremely used construction material within the world, which always uses natural resources like lime, aggregates and water. The production of cement in world has increased greatly, due to this cement production emission of CO2 gas has been increased tremendously, ultimately environmental pollution increased to very large extent. This affect to environment has been reduced by cement has been replaced by some supplementary materials like Dolomite Powder or Fly ash or GGBS & so on. Dolomite Powder was studied and lots of research work has been made on other waste materials and it is found there is a great future scope for research on Dolomite Powder as a replacement to cement, sand or both. In this study, the cement is partially replaced by dolomite powder at 10%, 20% and 30%. The preliminary properties of cement, fine aggregate and coarse aggregate are studied. The concrete specimens were prepared and tested for 7, 14 & 28 days strength. The Mechanical properties like compressive, flexural and split tensile strength of concrete with dolomite powder was compared with those of the reference specimens. As per the results this indicates the replacement of cement with dolomite powder increases the compressive and split tensile strength of concrete Within Certain limit. As per the result obtained 10% replacement of cement with dolomite powder has been done and which gives better result than conventional concrete, when examined for the mechanical properties.

KEYWORDS: Dolomite Powder, Ordinary Portland cement (53 Grade), Sand and coarse aggregate, Compressive Strength, Flexural Strength, Split tensile Strength.

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Application of Waste Foundry Sand for the Evolution of Low-Cost Concrete

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Abstract: Metal foundries use large amounts of sand as part of the metal casting process. Foundries successfully recycle and reuse the sand many times in the casting process. When the sand can no longer be reused in the foundry, it is removed from the foundry and is termed as foundry waste sand. The generation of waste foundry sand as a byproduct of metal casting industries causes environmental problems because of its improper disposal. Thus, its usage in building material, construction, and other fields is essential for the reduction of environmental problems. Like many waste products, foundry sand has beneficial applications to other industries. Foundry sand consists primarily of silica sand, coated with a thin film of burnt carbon, residual binder (bentonite, sea coal, resins), and dust. Foundry sand can be used in concrete to improve its strength and other durability factors. Foundry sand can be used as a partial replacement of cement or as a partial replacement of fine aggregates or total replacement of fine aggregate and as a supplementary addition to achieve different properties of concrete. This research is carried out to produce a low-cost and eco-friendly concrete. This work demonstrates the use of waste foundry sand as a partial replacement by fine aggregate in concrete. An experimental investigation is carried out on a concrete containing waste foundry sand in the range of 0%,10%,20%,30% 40%, and 50% by weight for m-25 grade concrete(pcc). Material was produced, tested, and compared with conventional concrete in terms of workability and strength. These tests were carried out on a standard cube of 150*150*150* mm for 7, 14, and 28 days to determine the mechanical properties of concrete. Through experimental results the variation of compressive strength with the partial replacement of waste foundry sand can be found out. This work aims to know the behavior and mechanical properties of concrete after the addition of industrial waste in different proportions by tests like compressive strength.

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Experimental Study on Mechanical Properties of Concrete Partial Replacement of Fine Aggregate with Crumb Rubber

Kasu Ravi Siva Sri Ganesh[1] | Gunana Chanti[2] | Gunday Vijay Raj Gowtham[3] | Amarthala Sai[4] | S Vamsi Harischandra Prasad[5] | Dr. Dumpa Venkateswarlu[6]

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Abstract: This paper shows the experimental study on the consumption of refuse tyre crumb rubber in concrete in replacement for fine aggregate in different percentage along with the use of silica fumes as mineral admixture to alter the bonding properties of the rubberized concrete in a positive way. The use of waste rubber tyre leads to the protection of environment and also it aids in preserving the natural aggregates. In this study the waste tyre crumb rubber was used as a replacement for natural fine aggregates and was tested for the mechanical properties of M25 grade concrete as per IS 10262-2009. Three different properties of rubberized concrete were tested namely compressive strength, flexural strength and split tensile strength. According to the test result it was noticed that there is decrease in the compressive strength, split tensile strength and flexural strength when the percentage of rubber cement is increased as compared to the nominal mix. The percentage replacement of natural fine aggregate with crumb rubber was 5%, 10% and 15%.

KEYWORDS: Crumb rubber, Fine aggregate, Mechanical properties, Waste tyre.

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An Experimental Study on Soil Properties by Inducing Plastic Strips

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Abstract: Black Cotton soils with high potential for swelling and shrinking as a result of change in moisture content are one of the major soil deposits. Soil stabilization is the process which improves the physical properties of soil, such as shear strength, bearing capacity which can be done by use of controlled compaction or addition of suitable admixtures like cement, lime, sand, fly ash or by providing geo textiles, geo synthetics etc. The new technique of soil stabilization can be effectively used to meet the challenges of society, to reduce the quantities of waste, producing useful material from non-useful waste Since the use of plastic in diversified forms such as chairs, bottles, polythene bags, etc., has been advancing speedily and its disposal has been a problem all the time regarding the environmental concern, using plastic as soil stabilizer would reduce the problem of disposing the plastic as well as increases the density and California Bearing Ratio (CBR) of soil in an economical way. In the present study, an experimental program was conducted for stabilization of Black Cotton Soils by adding plastic strip An experimental program was undertaken to study the effect on High Compressibility clays reinforced with randomly distributed plastic fibers of different aspect ratio were mixed with expansive soil in different proportions. Samples were tested with 0%, 2% ,4%, 6%, 8% of 12mm plastic fibers by dry weight. The results of Compaction were described. The influence of test parameters such as the amount of reinforcement and moisture content are discussed. Based on the results obtained, it was observed that there is significant decrease in MDD values with the inclusion of Natural fibers up to 8 % fiber content for 12mm fiber length and OMC is almost constant up to 4% and after that it will slightly increase.

KEYWORDS: Expensive soil, plastic fibres, CBR test.

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An Experimental Study on Strength Characteristics of Concrete by Partial Replacement of Cement with GGBS and Fine Aggregate with Copper Slag

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Abstract: Utilization of industrial waste (slag) in the concrete is one of the alternative. It not only increases the properties of concrete but also reduces pollution in the environment. The industrial waste were dumped on land or discharged into water bodies and thus become a large source of environmental pollution This paper shows that the results of an experimental study on strength characteristics of concrete. This work is carried out to find out the effects of partially replacing cement with GGBS and fine aggregate with copper slag. Copper slag is an excellent by product due to its chemical composition which includes high iron, silica and aluminium oxide content, it can be used as partial replacement for sand in concrete mix. Our project deals with partial replacement at 5%, 10%, 15%and 20% mass of cement with GGBS and 10%, 20%, 30% and 40% fine aggregate with copper slag in concrete. We compared the properties like compressive strength , split tensile strength , flexural strength of concrete made with replacement of GGBS and copper slag to the conventional concrete. The compressive strength, split tensile strength and flexural strength of concrete with GGBS and copper slag are high when compared with conventional concrete.

KEYWORDS: Compressive strength, flexural strength,split tensile strength, GGBS, Copper Slag

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Experimental Investigation on Conctrete by Partial Replacement of Fine Aggregate with Granite Powder

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Abstract: Many industries are producing waste by-products and their disposal without creating any disturbance in the public, environment, and eco-system is a major challenging task to the researchers, engineers and environmentalists. Since construction materials are being exploited by mankind, identifying the waste materials which are being disposed off and the properties of these materials which resembles any constituent in concrete mixture can reduce the problem to some extent. The main objective of this study is to investigate the characteristic compressive strength of M30 grade concrete in which major constituents such as cement and fine aggregate are replaced with granite dust which is a waste by-product from the industry. The replacement is done in various proportions i.e., 5%, 10%, 15% and 20% and are compared with the strength of concrete prepared by nominal mix which has no replacements. It is concluded that cement and fine aggregate replaced with granite dust at a proportion 15% has obtained maximum compressive strengths of M30 grade concrete at 28 days standard duration. It is also apparent from the study that the compressive strength is maximum for concrete in which fine aggregate is replaced with granite dust than the strength of concrete which replaces cement.

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An Experimental Study on Concrete Properties by Partial Replacement of Cement and Fine Aggregate with Metakaolin and Quarry Dust

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Abstract: This paper shows that the results of an experimental study on Concrete is carried out to find out the effect of partially replacing Cement with Metakaolin and Fine aggregate with Quarry dust.The partial replacement of cement with metakaolin which are having silica used as admixture for making concrete as well as partial replacement of fine aggregate with quarry dust due to the low availability of fine aggregate. Our project deals with partial replacement at 0%, 5%, 10%, 15%, and 20% mass of Fine aggregate with Quarry dust and Cement with Metakaolin in M-25 grade of concrete.The properties of concrete like compressive strength, split tensile strength and flexural strength of concrete made with partial replacement of cement and fine aggregate with metakaolin and quarry dust is high compared to the nominal concrete.The maximum results of Compressive Strength, Split-Tensile Strength and Flexural Strength gained at 15% of the partial replacement ofCement and Fine Aggregate with Metakaolin and Quarry Dust respectively.

KEYWORDS: Compressive strength, flexural strength, metakaolin, quarry dust, split tensile strength.

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Improvement of Compressive Strength and Permeability Test on Pervious Concrete

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Abstract: Pervious concrete is a special type of concrete, which consists of cement, coarse aggregates, water and if required, admixtures and other cementations materials. As there are no fine aggregates used in the concrete matrix, the void content is more which allows the water to flow through its body. So the pervious concrete is also called as permeable concrete and porous concrete. There is lot of research work is going in the field of pervious concrete. The compressive strength of pervious concrete is less when compared to the conventional concrete due to its porosity and voids. Hence, the usage of previous concrete is limited even though it has lot of advantages. If the compressive strength and flexural strength of pervious concrete is increased, then it can be used for more number of applications. For now, the usage of pervious concrete is mostly limited to light traffic roads only. If the properties are improved, then it can also be used for medium and heavy traffic rigid pavements also. Along with that, the pervious concrete eliminates surface runoff of storm water, facilitates the ground water recharge and makes the effective usage of available land.

KEYWORDS: CEMENTITIOUS MATERIALS , NO FINES, PEA GRAVEL AGGREGATES, PERVIOUS CONCRETE, POROUS CONCRETE

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Soil Stabilization by Using Citrus Bio- Enzyme

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Abstract: In India, urbanization in recent decade's demands to take up construction of civil engineering projects even in weak soil due to the land constraints has taken a boost. This requires huge amount of natural soil excavated or deposited which has economical issue and environmental issues. Due to these issues there is a development of alternative methods such as use of natural products or reuse of the industrial by products.

Soil stabilization is one of the techniques which can be used for improving the properties of soil by using different types of waste products or industrial by products. Soil stabilization also improves the engineering properties e.g. bearing capacity, compressibility, strength, and various other properties of soil.

This paper presents investigation of series of laboratory experiments has been performed to study the engineering properties, Optimum Moisture Content (OMC), Maximum Dry Density (MDD), California Bearing Ratio (CBR) and Unconfined Compressive Strength (UCS) of the virgin soil and the soil mixed with the citrus bio-enzyme. In this first we have conducted the above experiments on virgin soil and later we have done for citrus bio-enzyme mixed with the locally available soil.

The experimental results had shown a significant change in the properties of soil with the addition of citrus bio-enzyme. From this investigation we want to conclude that the addition of citrus bio- enzyme can improve the strength characteristics of the soil.

KEYWORDS: Citrus bio-enzyme, stabilization, engineering properties, optimum moisture content (OMC), maximum dry density (MDD), California bearing ratio (CBR), unconfined compressive strength (UCS).

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Sustainable Urbanization of Rural Villages in A Smart City Pattern

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Abstract: This paper aims to analyze scientific and experiential studies focusing on both environmental sustainability and smart city concepts to understand the relationship between these two. In order to do so the study identifies information about researchers, models, frameworks and tools focused on the chosen themes. This research uses a qualitative methodology, through a systematic review of the literature, and previous project which examines the terms, 'smart city' and 'sustainability', aimed at sustainable development of smart cities. For this, three databases were used: Scopus, Science Direct, and Emerald Insight. This paper provides detailed information on the most recent tools and concept involved on the smart cities. The paper can serve as a basis for researchers seeking background information for further investigations. The findings provide invaluable insights for scholars researching on the subject, and public managers considering applying those into practice in their cities.
The development on the world nowadays has led the natural calamities and the whole globe to some sort of climatic change issues and global worming due to a lot of emitted gases and harmful activities.

whether these activities comes from industries, manufacturing companies or from the resources human being use nowadays to create a suitable living standards regardless of considering the consequences on the environment and
Here it comes the concept of the self-sustainable smart cities by using the new technologies and natural resources more effective urban organization with a systematic way to improve quality of living ,promote sustainability and more cautious to the harm on the environment .

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Flexural Behaviour of Reinforced Recycled Aggregate Concrete Beams

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ABSTRACT

Recycling of waste concrete is one of the critical and sustainable solutions for the increasing disposal of waste crisis and depletion of natural coarse aggregate as well as fine aggregate sources. As a result, RCA i.e, recycled coarse aggregate is produced and upto now it has generally been utilized in low value applications like pavement base. But, it is essential to study in the terms of strength and durability of the RCA based concrete. In the present experimental study, in order to study the flexural behavior of RAC high strength concrete prepared with glass fibers when compared to the behavior of natural aggregate concrete beams under short-term loading. M50 grade concrete was developed by using silica fume as mineral admixture in the dosages ranging from 0-20% with increments of 5% and 1.5% SP along glass fibers in the volume fractions of 0.5-2% with increments of 0.5%. Further, RCA in the increments of 0-100% was studied and a optimal mix is chosen and glass fiber reinforced recycled coarse aggregate concrete beans were casted and tested for flexural behavior. It is concluded that, the utilization of RAC in concrete beams along with glass fibers is technically feasible.

KEYWORDS:*Recycled Aggregate, High Strength Concrete, Glass Fibers, Silica Fume*

INTRODUCTION

Large quantities of concrete waste have been scrapped and discarded throughout numerous countries, which makes demolished concrete waste a serious global environmental concern. Several efforts have been made to decrease its environmental impact and to encourage the recycling of demolished concrete. However, ways to reuse demolished concrete usually are limited to pavement base or backfill for retaining walls, which do not necessarily require structural high performance. Several studies (Dhir et al., 1999; Fathifazl et al., 2009; Khatib, 2005; Kim et al., 2002; Maruyama et al., 2004; Xiao et al., 2005) have been carried out in an attempt to expand the recycling rate and uses of concrete waste in the construction industry; these studies have examined mechanical properties, mixture design, design specifications and so on. It has been found that the mechanical properties of recycled aggregate concrete (RAC) may be inferior to those of conventional concrete that uses natural aggregate, but that RAC is still sufficient for some practical applications in the construction industry (Xiao et al., 2005). For example, recycled fine aggregate up to 20% or recycled coarse aggregate up to 30% can be used as replacement aggregate without any reduction in strength (Khatib, 2005). Furthermore,

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Earthquake Analysis of Multistoried Residential Building – A Case Study using ETABS

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ABSTRACT

The country's development is made in determined by means of the infrastructural development of the country, which includes the construction of the roads, multi storied structures, industries etc.,. Also, the construction of the multi storied buildings have been started in the early 1990's of the decade considering the seismic loads as per the then code provisions. But with the upgradation of the seismic codes in the present day practice, there were some important consideration to be taken for all the structures that are going to be constructed.

In the present study, an attempt has been made by taking a buildings with shear wall is a typical feature in the modern multi-storey construction in urban India. Such features are highly undesirable in building built in seismically active areas. This study highlights the importance of explicitly recognizing the presence of the shear wall in the analysis of building. Design of RCC elements will also be perform as per IS- 456 : 2000 for the building with shear wall . A numerical study will perform using ETABS Software will be used for 3D multi storey frames with and without shear wall to study the responses of the structure under different earthquake zones. Shear force, Bending moment,Axial force, inter storey drift, base shear, storey shear,storey moment will be computed for both the buildings with and without shear wall and comparing the results. It was identified that, with the increasing zone number, the resultant shear forces, base shear, and the moments of the structures are increasing and they can be countered by means of shear wall construction at appropriate locations.

KEYWORDS: *Shear wall, earth quake, base shear, ETABS, buildings.*

I. INTRODUCTION

From a long time it has been the constant effort of structural engineers to improve their concepts of analysis and design so that an economical structure is obtained consistent with safety and serviceability. The introduction of various grades of steels helped in achieving considerable economy in the use of scarce minerals and in reducing the cost of construction.

A complete knowledge of the behavior of structures is essential for design and such knowledge as mainly obtained though organized research in laboratories. Ultimately such knowledge finds acceptance in the "codes of practice" in various countries. These research and development programs are very costly to be afforded by any one country. These research developments have become truly international and this is particularly true in the field of "Limit state design of R.C.C.Structures". The theory of elasticity itself is accurate and scientific the loads acting on a structure and the limiting stress of materials used in that structures cannot be accurately predicted. By specifying low values for working stress

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An Experimental Study on Strength Properties of Concrete By Adding Human Hair Fibers

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ABSTRACT

This project is intended to analyze the Performance of Hair Reinforced Concrete. Fiber reinforced concrete can offer a convenient, practical and economical method for overcoming micro-cracks and similar type of deficiencies. Since concrete is weak in tension hence some measures must be adopted to overcome this deficiency. Human hair is strong in tension; hence it can be used as a fibers reinforcement material. Hair Fibers (HF) an alternate non-degradable matter is available in abundance and at a very cheap cost. It also creates environmental problem for its decompositions. This particular project has been undertaken to study the effect of human hair on plain cement concrete on the basis of its compressive strength, flexural strength, and Split Tensile strength tests. Experiments were conducted on concrete beams and cubes with various percentages of human hair fibers i.e. 0%, 0.5%, 1%, 1.5% by weight of Concrete. For each combination of proportions of concrete one beam and three cubes are tested for their mechanical properties. By testing of cubes and beams we found that there is an increment in the various properties and strength of concrete by the addition of human hair as fiber reinforcement.

KEYWORDS : *Human Hair fibers (HHF), Fiber reinforced concrete (FRC), Aspect ratio, Compressive strength test, Split Tensile Strength Test, Flexural Strength Test.*

INTRODUCTION

Definition & History of concrete is a material used in building construction, consisting of a hard, chemically inert particulate substance, known as an aggregate (usually made from different types of sand and gravel), that is bonded together by cement and water. In 1756, British engineer, John Smeaton made the first modern concrete (hydraulic cement) by adding pebbles as a coarse aggregate and mixing powered brick into the cement. In 1824, English inventor, Joseph Aspdin invented Portland cement, which has remained the dominant cement used in concrete production. Joseph Aspdin created the first true artificial cement by burning ground limestone and clay together. The burning process changed the chemical properties of the materials and Joseph Aspdin created stronger cement than what using plain crushed limestone would produce.

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A Study on M40 and M45 grade Ordinary Portland Cement in Marine Environment

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ABSTRACT

Concrete is the universally accepted building material used for construction purpose and it is the second most used material used in the world next to water. Out of many advantages of using the concrete because of their mechanical properties, yet there were some limitations to the concrete in view of brittleness of the concrete, poor tensile strength properties and low durability under marine environments. Also, there were very limited studies on the mechanical and durability properties or behaviour of concrete subjected to Marine environment or aggressive environment conditions. In the present study, it is proposed to study the strength and the durability properties of the concrete in marine environment for M40 and M45 grade of concrete. Different set of cubes were casted for both M40 and M45 grade of concrete, cured under natural curing condition as well as in saline water of salinity 35 PPM an equivalent salinity of sea water for 7 days, 28 days, 90days, 180 days and the corresponding mechanical and durability properties were compared. The test results showed that, there was no considerable change or difference in the normally cured and saline water cured concrete for both the grades of concrete.

KEYWORDS: *Concrete, M40 grade, M45 grade, curing, saline water curing, mechanical properties, Durability*

I. INTRODUCTION

Concrete is the most common constructive material in the world used for around centuries due to its very strong and versatile mouldable nature. There are number of reasons why concrete is preferable i.e. due to its ability to withstand deterioration, resistance to high temperature and it is economically cheapest and readily available constructive material with the mixture of cement, fine aggregate, coarse aggregate, water. Concrete being such strongest material, is also being deteriorated due to environmental problems. The effect due to such pollution is questioning the strength properties of concrete which leads to collapse of the structure.

The pollution here, in this research, refers to the different kinds of chemicals that react with the concrete structure such as different industrial wastes that have been dumped into the land, so when construction in such areas takes place then the chemicals that are present reacts with the concrete structure and may damage the integral properties of concrete. Also, when the construction activity takes place offshore then the salts present in the sea water also may cause damage to the concrete structure not directly but by the prolonged chemical reactions that take place.

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Experimental Study on Mechanical Properties of High Strength Glass Fiber Reinforced Light Weight Aggregate Concrete

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ABSTRACT

Over the past few decades, extensive studies were in progress all around the globe in concrete technology in finding sustainable alternative materials that can partially or fully replace OPC along with the requirements like durability and strength aspects. Among all the available alternative materials, the industrial waste exhausts like fly ash, silica fume, GGBS, metakaoline and rice husk ash etc., are found to be quite promising. In the present study, a mix design high strength grade concrete of M60 is produced by using binary blending technique by the utilization of Silica fume(SF) and Metakaoline(MK) as partial replacement by weight of cement at different blended percentages ranging from 0-30% in the increments of 10% along with glass fibers having aspect ratio of 100. The different proportions of glass fibers are added in the volume fraction percentages of 0.5-2% in the increments of 0.5%. The test results of fiber reinforced specimens with different percentages of binary blend are compared with control specimens to study the behavior of FRC properties with various percentages of the blends as partial replacement by weight of cement. The test results concluded that the optimum blended percentage of silica fume and metakaoline is 15% i.e., 7.5%SF+7.5%MK along with SP percentage as 1.5% and glass fiber percentage as 1.5% when compared with the control mix. Further, light weight aggregate i.e., pumice stone is replaced to this mix to coarse aggregate at percentages of 25%,50%,75% and 100% respectively and the compressive strength characteristic along with density of concrete was studied and reported.

KEYWORDS: *Mechanical Properties, Glass Fibers, Volume Fraction, Blending, Light Weight Aggregate*

I. INTRODUCTION

HSC is referred to be as High strength concrete and is basically utilized for concrete which has a compressive strength more than 41 MPa. The committee of ACI has given a definition of HSC that it is a type of concrete which has the capacity to acquire a compressive strength of design with a minimum of 41 MPa or greater. With the design of high strength grade cement and feasibility with various types of mineral and chemical admixtures, the researchers are able to produce the concrete with more than 100MPa strength. The design and development of HSC has enabled the construction industry to construct taller and longer spanned structures. It is a proven fact that the relative higher compressive strength of HSC is an attractive benefit to the construction of various engineering structures. Further, the enhanced strength

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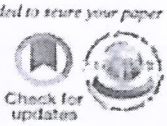

Seismic Analysis of Multi Storied Reinforced Concrete Buildings with and without Mass Irregularity using ETABS

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ABSTRACT

Irregular buildings make up a large portion of the urban infrastructure. Thepresence of irregularities is due to area, architectural, functional, and economic constraints.The main objective of this research is to improve the understanding of the seismic behavior of the building structure with vertical irregularities. This is done by quantifying the effects of vertical irregularities in mass.

The effect of irregularities in the distributions of mass is considered. The seismicresponse of irregularities is calculated by response spectrum analysis, equivalent lateralforce method. A base structure is developed and cases thatrepresent irregular structures are defined by modifying the vertical distribution ofmassofthe basecase. The modelling of the whole building iscarriedoutusing the computer programETABS.

Parametric study on Maximum storey displacement in modal deformation, Earthquake in X and Y–directions, Fundamental time period in Modes 1,2 and 3, mass participation of the structure in X in mode-1, Y in mode-2 directions and torsion about Z-direction in mode-3 havebeen carried out using equivalent static analysis and response spectrum analysis toinvestigate the influence of the parameter on the behavior of the building with massirregularity.Theselected buildingisanalyzed throughnumerical models.

KEYWORDS: *Mass Irregularity, ETABS, Modal Participation, Response Spectrum Analysis, Storey Displacement, Time Period.*

INTRODUCTION

Earthquakes are one of the most destructive of natural hazards. Earthquake occurs due to sudden transient motion of the ground as a result of release of elastic energy in a matter of few seconds. The impact of the event is most traumatic because it affects large area, occurs all on a sudden and unpredictable. Earthquake not only damage villages, towns and cities but also leads to economic and social system of a country. The vibration can affects settlement. Some of the soil types like, alluvial or sandy, silts get fail during earthquake when compare to other soils. Earthquake can be measured by Magnitude (M) which was obtained by recording the data of motions on seismograms. But shaking of the ground surface will have different intensities at

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Design and Analysis of Truss Type Steel Buliding by using Tekla Software

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ABSTRACT

Steel offer the range of advantages to the structure Industry. Steel is also one of the most sustainable construction materials, building owners naturally value the flexibility of steel buildings in addition the value of benefits they provide.Steel trusses are widely used to carry the roof loads and to provide horizontal stability. There are numerous advantages to using steel trusses instead of traditional wood trusses, but the main reasons are simplicity and strength. Steel trusses offer a high strength, light weight roof system that can be installed quickly.In this project I use Tekla software. It has a very interactive user interface which allows the users to draw the frame and input the load values and dimensions. Tekla structures are powerful and flexible software for all structural projects. Then according to the specified criteria assigned it analyses the structure and designs the members with structural steel.Our final work was the proper analysis and design of truss type steel building.The Aim of present study is to define proper technique for creating Geometry, cross sections for column and beam etc., developing specification and supports conditions, types of Loads and load combinations. I analyzed and designed a truss type steel building initially for all possible load combinations (dead, live, wind, seismic loads). In this analysis process different types of codes are utilized. Dead load IS:875(Part-1), Live load IS: 875(Part-2), wind load IS 875-(Part-3), seismic load IS 1893. In this study a truss type steel structure is analyzed for seismic and wind load combination using tekla. Implemented manual designing and modelling by using of Tekla software

KEYWORDS: *Design, Analysis, Geometry, Structure, Wind load, seismic, Tekla Structures.*

I. INTRODUCTION

A Truss is an important structure type in structural engineering. They are one of the most widely adopted structural designs, many times being utilized as the structural solution of choice for bridges, roofs, cranes, aircrafts, and even robots and spaceships. A steel truss is an arrangement of steel pieces connected to form a structure intended to span or bridge a gap of some sort. A steel truss transfers weight, or pressure applied to it, to weight-bearing structures on either side of the gap. Steels trusses come in many types and are commonly used for large roofs and bridges. While any truss can be made of steel to improve its load-carrying capabilities, and many often are, there are several types of steel truss that are more common than others.

Trusses are used in a broad range of buildings, mainly where there is a requirement for very long spans, such as in airport terminals, aircraft hangers, sports stadia roofs,

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Analysis & Design of Flyover by using Staad. Pro v8i

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ABSTRACT

As the population is growing, urbanization is caused which results in increasing of traffic with usage in more number of vehicles for different means of transport.As stated above the growth of population and the usage of vehicles for their different means will automatically result in increase in flow of vehicles which is called as traffic. To overcome the issue of traffic getting jammed (which means having obstacles for free moment or flow at a particular place), there are many different ways implemented to overcome it. When coming to Highways one of the efficient ways of overcoming it is construction of a flyover.Here in this project we are going to a design a flyover at Morampudi Junction located in Rajahmundry Andhra Pradesh along the National Highway 216A as a proposal in order to overcome the issue of traffic jam and also to reduce the rate of accidents occurring at the junction.

By considering all the data collected conducting different examinations I am going to design and analyze the flyover using software STAAD.Pro V8i to study Bending Moment, Shear Force, Nodal Displacement values by considering various types of loads considered are Dead Loads, Live Loads, Wind Loads, Vehicle Load which are taken from Indian Standard Codes IS – 456, IS – 800 & IRC: 6 - 2016.

KEYWORDS: *STAAD.PRO V8i, Shear force, Bending moment,* ***IS – 456, IS – 800 &****IRC: 6-2016*

INTRODUCTION

India is the country with the second largest road network across the world with 5.4 million Km. This road network helps transportation more than 60% of all goods in the country and 85% of passenger traffic in India. Road transportation system has gradually increased over yearswith the improvement in connectivity between cities, towns and villages across thecountry. One of the major components of roadways if Flyover's.

1.1. Introduction to Flyover

Flyover may be referred as an overpass, a h igh-level road bridge that crosses over a highway interchange or intersection.

It is a construction that is built over physical obstacles such as water bodies, valleys and roads which are provided for passage over the obstacle. Designs of flyover vary depending on the requirements and functionalities of the flyover, the nature of the soil where the flyover is constructed, the material that are used for construction and the funds available to build it.

1.2. History Flyover

The first flyover in the world was constructed and started in the year 1843 by the London and Croydon Railway department at Norwood Junction

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Analysis and Design of Reinforced Concrete Multi-Stored Building (G+5) by using Tekla Software

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ABSTRACT

The rapidly developing world, in construction industry software's are used today is the urgent necessity of the moment in order to match the peace of infrastructural development. The main objective of the study is checking the computability of results. The analysis and design of Reinforced Concrete structures is a final stage in the construction industry to deliver the projects with in the estimated time and within the budget. Analysis and design tasks is not an easy matter of fact. Especially specialized software's are used such as Robot structural Analysis, MIDAS Gen, SAP2000, STAAD PRO, ETABS, TEKLA Structural designer, S-Frame and so on. To gain the design results most commonly used software are validated. In manual design process Indian Standard Codes are utilized and different design modules are used to gain the confidence of the users. The basic elements of a RC Structure such as beams, columns and simple frame have been discussed. In analysis process, shear force and bending moment of beams and columns are comparable in all cases. Thereafter the loads are calculated namely the dead loads, which depend on the unit weight of the materials used (concrete, brick), live loads, which according to the code IS 875-1987 and earthquake load according to IS1893 (PART-1). IS 456:2000 code of practice for plain and reinforced concrete and IS 800:2007 limit state design and seismic ductile design IS:13920(2016) and seismic loading IS 1893 (part 1):2016 and wind loading IS875(part 3):1987. Finally, the footings are designed based on loading from the column and the soil bearing capacity for the particular area. Most importantly, the sections must be checked for all the four components with regard to strength and serviceability factors.Construction plays a significant role in the emergence of ecological problems such as environmental pollutions, energy consumption and carbon emission and so on. In the emergence of ecological situations the specific attention has to be devoted and develop the sustainable and green solutions in the design of buildings and structures.

KEYWORDS:*Geometry, Structure, Analysis, Shear force, Bending moment, Deflection, Wind analysis, Seismic analysis, Finite element analysis, Torsion, Static and Dynamic analysis's.*

I. INTRODUCTION

Computer Literacy started increasing rapidly from 1994 and by 2000 there were thousands of companies offering software, website solution to various requirements. During that time Indian software professionals were busy with fixing the Y2K bug. During Dot com bust in 2000-01, many companies invested heavily on software's,

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Study on Mechanical Properties of Fiber Reinforced High Strength Light Weight Concrete

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ABSTRACT

Concrete, one of the most universally accepted construction material, exhibits higher values of compressive strength, but the same cannot be said in terms of its tensile strength. This is the prime explanation for the setback of this construction material, to be used in place of achieving a higher tensile strength. Different endeavors have been made to improve the overall tensile strength of concrete by using diverse materials. These materials were used either as a form of replacement of its main constituents, or simply as an addition to the other constituents. Out of all such materials, the use of different types of fibers, added a definite proportion of tensile strength without actually altering the configuration of the concrete blocks to a larger extent. Also, in some cases the density of the concrete is a one of the influencing parameters in structural elements and this study is based on the optimization of fibers as a replacement of the Ordinary Portland cement (OPC) along with the use of different industrial waste by products i.e., mineral admixtures and also the light weight aggregates in order to reduce the self weight of the concrete. In this study, an attempt will be made to investigate the mechanical properties of M60 grade high strength fiber reinforced light weight aggregate concrete.

KEYWORDS: *High Strength Concrete, Fibers, Mineral admixtures, Mechanical Properties*

I. INTRODUCTION

Ordinary Portland Cement is a major constituent material that is utilized in the manufacturing of concrete and it has no other alternative substitute in the field of civil engineering. The major problem with the cement production is it generates excessive amounts of green house gases (GHG's) into the atmosphere. Henceforth, it is recommended that cement should be replaced with other alternative and sustainable materials which shows no or less environmental influence.

Different types of studies are being conducted in and around the India in order to study the impact of industrial waste exhausts on the cement properties and the studies are resulted in a positive way. These industrial waste exhaust materials also termed as pozzolans, with their pozzolanic action. Various industrial waste materials like GGBS, silica ash, rice husk etc are abundantly available in different parts of India and are being extensively used as replacements to the cement.

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Fuzzy Logic Based Grid Synchronization with Renewable Energy Sources and Energy Storage

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ABSTRACT

Micro-grid is a promising area that might provide a solid solution for more and more stress on the utility supply and transmission line. Generally micro- grid comprise of renewable energy sources such as photovoltaic (PV), wind, fuel cell (FC) stack etc., as micro-grid involves renewable energy sources which have a significantly different dynamic behavior, dissimilar generating capacities and disruptive effects such as voltage dips and fluctuations, frequency variation, and harmonic distortion are handled through centralized monitoring in conjunction with hierarchical control. This paper proposes a GS technique based on controller area network (CAN) communication. CAN is a robust fault tolerant multi host serial communication network capable of providing 1 Mb/s data rate. The proposed scheme is based on CAN communication between the microgrid master controller (MMC), local controllers (LC), load controller and grid synchronization system. The reliability and sustainability of the resulting complex micro-grid synchronization is ensured through the proposed reconfigurable control and power network of the micro-grid, supported by a comprising fuzzy controller areanetwork.

KEYWORDS: *Black-start, controller area network (CAN), grid synchronization (GS), island mode, microgrid, smart grid, fuzzy logic controller.*

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I. INTRODUCTION

With the wider integration of Renewable Energy Sources (RES) to the power networks, especially in distribution levels, operational reliability and resilience of microgrids have attracted increasing interest for enhanced integration in future smart grid architectures of power systems [1]. The microgrids in distribution networks can be operated autonomously for a grid-connected or islanded mode to improve reliability and quality of power delivery [2]. In these microgrids, the RESs are either small-scale synchronous generators or converter-interfaced sources (e.g. PV, energy storage, wind, etc.) resulting in a small inertia of the network [3]. In addition, whereas the renewable energy resources are mostly intermittent in nature, it is assumable that the microgrid will require importing power from the main grid when the renewable resource and/or the synchronous generation are not sufficient for supplying and sustaining local loads. Under such circumstances, if an unintentional islanding event occurs, the local

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ANN Based Active Power Filter to Reduce Harmonics in a Micro Grid

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ABSTRACT

Now a day's Renewable energy generation system being the emerging new revolution in generating department, but to interface it with the Grid we required high power static PWM converters which are one of the cause for disturbance in power quality in our system. So, In this paper we are proposing a new control technique which is based on artificial neural network theory used in active power filter by using this the renewable sources are not only synchronized with the grid but also improves power quality by compensating the current harmonics and unbalanced current generated by sudden disturbance in load. The topology which is used for active power filter is four-leg voltage source converter. The ANN controller is not only improves the power quality; it also improves the total harmonic distortion in current by suppressing the harmonics. The mathematical modeling of the proposed system is explained in the paper. The active power filter is simulated with two control technique such as PI controller and ANN controller. The simulation results and the tabular form show the superiority of ANN controller over PI controller. The proposed circuit is tested under different operating condition through simulation in MATLAB/ SIMULINK and the results shows the potency of the system.

KEYWORDS: *Active Power Filter, Four-Leg Converters, PI Controller, ANN Controller, THD, Renewable Generation System.*

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I. INTRODUCTION

Presently a-days the substantial number of PCs and other touchy electrical burdens associated with the power lattice are straightforwardly influenced by control quality issues [1]. A standout amongst the most critical issues is identified with current music created by the expanding number of non direct loads associated with the power framework, for example, diode and thyristor frontend rectifiers. As an outcome, these music can cause voltage contortions, extra misfortunes in the influence framework, and breakdown of delicate electronic hardware. Hence, symphonious limitation gauges, for example, IEEE 519 [2], have been prescribed to confine the consonant streams infused into the framework by non direct loads. Shunt inactive channels, comprising of tuned LC channels and high pass channels, have been

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Simulation of Sensorless Speed Control of Induction Motor using Model Reference Adaptive Technique with Fuzzy Inference System

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ABSTRACT

In the course of recent decades innovative advances in power gadgets and an expanding interest for superior modern hardware has added to fast improvements in computerized engine control. The point of this paper is to plan a fuzzy logic controller to control the speed induction motor drive working without a speed or position sensor yet having a unique exhibition tantamount to a sensored vector drive. This paper displays the control of an enlistment engine through sensorless vector control utilizing pid and fluffy pid controller. The hypothetical premise of every calculation is clarified in detail and its exhibition is tried with reproductions actualized in MATLAB/SIMULINK..

KEYWORDS: *Sensorless induction motor, fuzzy PID controller, Model Reference Adaptive System (MRAS)*

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I. INTRODUCTION

Induction Motor (IM) can be considered as the 'workhorse' of the business as a result of its extraordinary highlights, for example, minimal effort, high unwavering quality, low fidleness, straightforwardness and toughness. Indeed, even today IMs particularly the squirrel confine type, are broadly utilized for single speed applications instead of variable speed applications because of the unpredictability of controlling calculation and higher creation cost of IM variable speed drives. In any case, there is an extraordinary enthusiasm on factor speed activity of IM inside the exploration network predominantly in light of the fact that IMs can be considered as a significant modern heap of a force framework. Then again the IMs expend a lot of power created. Most of IMs are worked at consistent speed, dictated by the shaft pair number and the stator supply recurrence. The two names for a similar sort of engine, enlistment engine and offbeat engine, portray the two attributes wherein this kind of engine varies from DC engines and synchronous engines. Acceptance alludes to the way that the field in the rotor is actuated by the stator flows, and nonconcurrent alludes to the way that the rotor speed isn't equivalent to the stator recurrence. No sliding contacts and changeless magnets are expected to make an IM work, which makes it exceptionally basic and modest to fabricate. As engines, they tough and require next to no support. Be that as it may, their velocities are not as effectively controlled

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Modeling and Simulation of NPC Inverter for Generation of Three Levels Based on LC Switching with ANN Controller

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ABSTRACT

This paper presents a new control scheme for three levels NPC Inverter to boost up the input dc voltage and givethree levels AC output voltage with less harmonic distortion in a single stage.Recently, Single stage highvoltage pick up support inverter is getting ubiquity in applications like sun powered PV, energy component,UPS systems and so on. As of late, single stage voltage support multilevel Z-Source inverter (ZSI) and Quasi Zsourceinverter (QZSI) have been proposed for DC-AC control transformation with enhanced power quality.Multilevel ZSI utilizes more number of high power inactive segments in the middle of the road arrange whichincrement the system measure furthermore, weight. Likewise its info current is irregular in nature which is notalluring in a portion of the applications like energy unit, UPS systems, hybrid electric vehicle and so forth. Inthis paper a consistent current info three level LC Switching based voltage help nonpartisan point clipped (NPC)inverter with ANN logic controller is proposed which utilizes similarly less number of high power detachedsegments at the same time holds every one of the benefits of multilevel QZSI/ZSI. It is ready to help the infoDC voltageand give required three levels AC output voltage in a solitary stage. The ANN -logic controller isincorporated to systematically control the time allocation for all the switching states based on instantaneousvoltage. Using the ANN controller for a nonlinear systemallows for a reduction of uncertain effects in thesystem in the system control and improve the efficiency . Enduring state investigation of the proposed inverter istalked about to define the connection between the info DC voltage what's more, three level AC output voltage.The proposed converter with ANN controller has been verified by simulation in MATLA Simulink

KEYWORDS: *Boost Inverter, PWM, Shoot –through, three level inverter .Z-Source inverter, ANN.*

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I. INTRODUCTION

Recently the modern power electronics equipment has attracted the attention in many industrial applications. Most of the industrial applications need high power equipment, such as motor drives, hybrid electric vehicles, renewable energy system, etc.[1]. Some industries require medium voltage and high power, so for these

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Power Quality Improvement in a Utility Grid by using Proportional Resonance Controller Based D-STATCOM

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ABSTRACT

Increasing awareness and concerns regarding unacceptable power quality are causing a growing interest in custom power devices, used to improve power quality on distribution level. One of the most interesting types of custom power devices, due to its exibility and fast control, is the shunt-connected voltage source converter (VSC), also known as the static synchronous compensator (STATCOM). A single distribution static compensator (DSTATCOM) connected at the beginning of the network working in current control mode is capable of circulating power. In this dissertation a comparative analysis has been made between the conventional proportional integral (PI) controller and proportional resonance (PR) controller. This voltage controller holds the voltage at the point of common coupling (PCC) and supplies/absorb necessary power to keep the system stability. The DSTATCOM is assumed with a battery to enable this facility. However, correcting the PCC voltage to 1 per-unit (pu) cause a large amount of reactive power to/from the utility substation. This increases the current flow in the system and increases the line loss where the R/X ratio is high. It is desired to have the least reactive power from the utility substation. A modified voltage magnitude controller can solve this problem though it changes the voltage of buses.

KEYWORDS: *D-Statcom, Frequency Compensation, Minimum Power Point Tracker, coordinated control, Distributed generation, PR controller, Voltage control.*

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I. INTRODUCTION

Distribution networks in different parts of the world have gone through significant growth and improvement with the utilization of distributed generation (DGs). This is line with the policies of government of countries towards the use of renewableenergy resources technology. Previously, the distribution system has been working on a unidirectional power flow but with the connection of DGs, the system has to accept bidirectional power flows which resulted in several technical issues such as voltage levels and power flow, protection issues, equipment thermal ratings and fault current levels [1]. One of the major concerns in the integration of DGs in the distribution systems is the voltage rise issue. This further requires the DNOs to find solutions to the overvoltage problems in ensuring that the

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An ANN Based SMES Implanted Smart Grid for EV Charging Station

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ABSTRACT

The battery lifetime of an electric vehicle (EV) has significant impact on the development of EV. In this paper a method with Superconducting Magnetic Energy Storage (SMES) is used to improve the battery lifetime of EV. The SMES is stabilizing the EV charging system voltage to improve battery life and charge efficiency on a smart grid. To verify the influence of the controlled SMES improves the system transient stability, situations under load fluctuation and fault, and the SMES capacity for system compensation have been investigated. The results obtained from the analysis indicate the compensating instantaneous voltage dip in the grid and improving the power system quality. So SMES increasing the power quality and stability of the EV system. In extension we are using ANN controller to generate the triggering pulses. The ANN circuit will be control the input and outputs.

KEYWORDS: *Electric Vehicle, SMES, Energy storage systems, ANN, Smart Grid*

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I. INTRODUCTION

The concept of Smart grid has offered consumers with increased reliability and reduction in total energy losses, and has become a promising alternative for traditional power distribution system. One area of study for the connection of a Smart grid to the distribution grid is the impact of power quality (PQ) problems on the overall power system performance. These PQ problems include voltage and frequency deviations in the grid voltage and harmonics in the grid voltage and load currents. To overcome the aforementioned PQ problems, several power-conditioning equipment's such as active filters, uninterruptible power supplies, dynamic voltage restorers, and unified PQ conditioners are usually employed by consumers to protect their loads and systems against PQ disturbances in the distribution network. However, these devices are usually installed at the consumer sides and the PQ problems that they are capable to handle are usually limited.

A. RESEARCH BACKGROUND

Electric vehicles are principal choice for green transportation .Electric vehicle (EV) technology is recognized by many countries as a key component to reduce harmful green-house gas emissions. The main component of greenhouse gas is carbon-di-oxide. Burning one gallon of gas creates 20 pounds of carbon dioxide, and the average car emits about six tons of carbon dioxide every year.

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Modeling and Simulink Analysis of BLDC Motor Speed Control with ANN Controller

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ABSTRACT

The paper is based on the artificial neural network based speed control of BLDC motor . The main purpose of this paper is to develop a low cost drive system for BLDC motor with reduced switching loss by the ANN. Due to the characteristics of the Brushless DC motor such as high efficiency, high power factor, high torque, low maintenance and ease of control, it is widely used in variable speed drives and industrial applications. The flexibility of the drive system can be increased by using ANN control. The BLDC motor is excited by a Four Switch Three Phase Inverter with minimum number of switches which in turn reduce the associated amount of switching losses. A simulation is carried out using MATLAB/ SIMULINK.

KEYWORDS: *speed control, BLDC, PI Control, ANN Control*

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I. INTRODUCTION

DC motor is designed to run on a DC electric power which is used electrical energy and produce mechanical energy. There are two types of DC motor which is brushed and brushless DC motor. Brushless DC motor is chosen in this project because of brushless DC motor (BLDC) is a synchronous electric motor which is powered by DC electricity and which has an electronically controlled commutation system, instead of a mechanical commutation system based on brushes In such motors, current and torque, voltage and rpm are linearly related. Other than that, brushless DC motor offer several advantages over the brushed DC motor. The advantages that provided by the brushless DC motor are higher efficiency and reliability, reduced noise, longer lifetime and elimination of ionizing sparks from the commutator. Fuzzy Logic Controller (FLC) is chosen as a controller for this project because it consists of several advantages compared to the other classical controller. The advantages of FLC are such as simplicity of control, low cost and the possibility to design without knowing the exact mathematical model of the process. It is suitable for applications such as the speed control of DC motor which has nonlinearities. The structure of FLC consists of the following three major components which the first one is fuzzifier that used for measurement of the input or definition of

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An Efficient Constant Current Controller and ANN Controller for RES Network

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ABSTRACT

This work presents the detailed modeling of grid integrated with the Photovoltaic Solar Power Generator. As the Photovoltaic System uses the solar energy as one of the renewable energies for the electrical energy production, it is inculcated in this work. The PV system is developing very rapidly as compared to its counterparts of the renewable energies. The DC voltage generated by the PV system is boosted by the DC-DC Boost converter. The utility grid is incorporated with the PV Solar Power Generator through the 3-phase PWM DC-AC inverter, whose control is provided by a constant current controller. This controller uses a 3-phase locked loop (PLL) for tracking the phase angle of the utility grid and reacts fast enough to the changes in load or grid connection states, as a result, it seems to be efficient in supplying to load the constant voltage without phase jump. The complete mathematical model for the grid connected PV system is developed and simulated. The results verify that the proposed system is proficient to supply the local loads. In this work, ANN controller is used for achieving constant current control.

KEYWORDS: *PV system, CCC,PWM Inverter, ANN controller*

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I. INTRODUCTION

A photovoltaic cell or solar panel is an equipment that converts solar power into voltage separately photovoltaic effectiveness. Sometimes the term photovoltaic cell is placed for designs planned explicitly to round up strength from dawn, but the term solar cell is used when the authority is unmentioned. Assemblies of cells are well-known make the photovoltaic cell, stellar detail, or photovoltaic arrays. Photovoltaic is the court of telecommunications and probe similar to the petition of solar collectors for solar radiation

Working:

Solar strength organizations enlist photovoltaic cell to apply the cheery electricity of daytime instantaneously into mechanical strength. The photovoltaic solar cell is semiconductor devices and that apply the sun rise into heat. Solar cells whatever employ transparent semiconductors, in the manner that silicon, show the advantages of supercharged and trustworthiness. Photovoltaic

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ANN Controller Based Electrical Vehicle Charging Station

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ABSTRACT

This paper proposes an electric vehicle (EV) charge-discharge management framework for the effective utilization of photovoltaic (PV) and Wind power output through coordination based on information exchange between home energy management system (HEMS) and grid energy management system (GEMS). In our proposed framework, the HEMS determines an EV charge discharge plan for reducing the residential operation cost and PV With wind curtailment without disturbing EV usage for driving, on the basis of voltage constraint information in the grid provided by the GEMS and forecasted power profiles. Then, the HEMS controls the EV charge-discharge according to the determined plan and real-time monitored data, which is utilized for mitigating the negative effect caused by forecast errors of power profiles. The proposed framework was evaluated on the basis of the Japanese distribution system simulation model. The simulation results show the effectiveness of our proposed framework from the viewpoint of reduction of the residential operation cost and PV curtailment.

KEYWORDS: *Electric vehicle, charging management, grid management system, ANN Controller.*

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I. INTRODUCTION

Reduction of CO_2 emissions to prevent global warming is a worldwide challenge. Electricity will account for almost a quarter of the final energy consumption by 2040 [1]; the power sector is needed to lead the way toward a decarbonized energy system. In Japan, in addition to CO2 emissions,primary energy self-sufficiency is a large issue. Energy self sufficiency has stayed at only 6% after the Great East Japan earthquake and the Fukushima Daiichi accident in 2011. In order to break down this emergency, the government is aiming to increase it to approximately 25% by 2030 [2]. On the other hand, the amount of CO2 emissions was 201 million only in the household sector in 2013, and the aim is to reduce this volume by 39.3% by 2030.

II. OVER VIEW

SMES is initially conceived as load leveling devices that is it is used to store energy in bulk and also to smoothening the utility's daily peak demand. In SMES, the electricity is stored by circulating a current in a superconducting coil. Because of no

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Application of Capacitor less D-STATCOM for Performance Enhancement of Wind Turbine Based Induction Generator

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ABSTRACT

Voltage stability is a key issue to achieve the uninterrupted operation of wind farms equipped with squirrel cage induction generators (SCIG) during grid faults. A capacitor less Static Synchronous Compensator (D-STATCOM) is applied to a power network which includes a SCIG driven by a wind turbine, for steady state voltage regulation and transient voltage stability support. The capacitor less D-STATCOM is controlled by using PQ controller technique with voltage regulation as basic scenario. The system is implemented using MATLAB/ SIMULINK. Results illustrate that the capacitor less D-STATCOM improves the transient voltage stability and therefore helps the wind turbine generator system to remain in service during grid faults. The time to reach steady state torque and speed without using vector control or direct torque control can also be achieved by using this capacitor less D-STATCOM control technique.

KEYWORDS—Multi-level Inverter, Modular Multi-level Converter (MMC), D-STATCOM.

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I. INTRODUCTION

Renewable energy sources (RESs) have experienced a rapid growth in the last decade due to technological improvements, which have progressively reduced their costs and increased their efficiency at the same time [1]. Moreover, the need to depend less on fossil fuels and to reduce emissions of greenhouse gases, requires an increase of the electricity produced by RESs. This can be accomplished mainly by resorting to wind and photovoltaic generation, which, however, introduces several problems in electric systems management due to the inherent nature of these kinds of RESs. In fact, they are both characterized by poorly predictable energy production profiles, together with highly variable rates. As a consequence, the electric system cannot manage these intermittent power sources beyond certain limits, resulting in RES generation curtailments and, hence, in RES penetration levels lower than expected.

A power electronic device is one that consists of a number of semiconductor components that is used to perform a specific function in a system. The

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Techno-Economic Optimization of Grid Connected Distributed Energy Systems using HOMER

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ABSTRACT

This study presents the techno economic feasibility on grid connected distributed energy system or micro grid for a big technical institute. It is focused on how to minimize the electricity consumption from the grid by producing as much as possible renewable energy and in addition to that it integrates green vehicle transportation usage such as hydrogen gas, electric cars etc. which are necessary elements of a sustainability in the proposed system. The work is initiated collecting the institute monthly electrical load data, climate data and associated monetary data with the aim of investigating a renewable energy supply system feasibility study. Different scenarios are developed according to the project needs and the scenarios were modeled by HOMER software. The study concludes with a direct comparison of the economic feasibility, renewable energy fraction and emission among all system looks for appropriate sustainable solution. This study will provide helpful insights to the relevant stack holders and policy makers in the development of grid connected distributed energy systems.

KEYWORDS: *Distribution Energy System-Modeling of HRES-HOMER Software-Size and Cost Optimization*

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I. INTRODUCTION

In present scenario, every country places considerable importance on sustainable development and energy security. Hence hybrid renewable becomes more significant sources. Energy requirement is an essential need to enhance the income, improved life quality of individuals. Developing countries on the way of growing their economies are in much demanding for electricity access to facilitate their economical and industrial growth.

Nowadays renewable energy resources are one of the promising ways to address many problems. Climate change, desertification, greenhouse effect, etc., lead the world towards sustainable energy era. Using natural and renewable resources such as wind, solar, geothermal, tidal, wave and hydroelectric offer clean alternatives for fossil fuel; in which they are omnipresent, abundant, free, clean and easily accessible even in isolated and

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AI Technique Based Fault Location in a Transmission Network with DG's

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ABSTRACT

The increase in usage of distributed generation(DG) have much impact on configuration and operation mode of power system. When DG units are connected to a transmission network, the system will be losing coordination among the network protection devices. Fault type and Fault line are identified by using Neural Network for a transmission network with dg's are used. This method can be able to determine the accurate fault type and fault line by using Neural network. Different fault currents data are considered to verify the accuracy of the fault type and faulty line of transmission system with DG's using MATLAB.

KEYWORDS: *Fault location, Transmission network, Distributed generation, AI Techniques*

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I. INTRODUCTION

The Electric Power System is divided into many different sections. One of which is the transmission system, where power is transmitted from generating stations and substations via transmission lines into consumers. Both methods could encounter various types of malfunctions is usually referred to as a "Fault". Fault is simply defined as a number of undesirable but unavoidable incidents can temporarily disturb the stable condition of the power system that occurs when the insulation of the system fails at any point. Moreover, if a conducting object comes in contact with a bare power conductor, a short circuit, or fault, is said to have occurred. The causes of faults are many, they include lighting, wind damage, trees falling across transmission lines, vehicles or aircraft colliding with the transmission towersor poles, birds shorting lines or vandalism.

II. BACKGROUND

The development of this project will ease user to perform the calculations of fault. This project is focusing on the development of a toolbox for power system fault analysis using MATLAB. Power system fault analysis is the process of determining the magnitude of voltages and line currents during the occurrence of various types of faults. The magnitude of these currents depends on theinternal impedance of the generatorsplus theimpedance of the intervening circuit.It can be of the order of tens of thousand of amperes. Faults on power systems can be divided into three-phase balanced faults and unbalanced faults. Three types of unbalanced

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Voltage Regulation in Distribution Network using Fuzzy Logic Controller

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ABSTRACT

Widespread penetration of Renewable Energy (RE) sources in distribution networks may introduce new technical challenges for the distribution network. These issues include voltage rise, voltage unbalancing, voltage regulation problem, thermal overloading, frequency fluctuation, flicker and harmonics. Consequently, the traditional operation of distribution networks limits the penetration level of RE sources and need to be revised to incorporate new control and protection strategies. In this project, a robust voltage control strategy that is fuzzy logic controller, which takes good use of the distributed energy storage (DES) units, is proposed to enhance the voltage stability and robustness of DC distribution network. The characteristics of AC/DC interface in network are analyzed, and the virtual inertia and capacitance are given to demonstrate the interactive influence of the AC and the DC systems. The control strategy for DES which is located at the AC micro grid or at the network terminal bus is designed based on the interactive characteristics, enabling the DES to respond to both voltage variation of DC network and frequency change of utility AC grid. The proposed comprehensive robust control strategy for DESs at different interfaces features independence of communication as well as enhancement of system robustness, and reduces the impact of DC distribution network on utility AC grid

KEYWORDS: *Renewable Energy, Distribution Generation, Voltage Regulation, Fuzzy Logic controller*

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I. INTRODUCTION

The research, development and implementation of efficient and cost-effective interconnection possibilities for offshore wind are a key element in achieving ambitious European renewable targets. Current trends in research and commercial applications of offshore wind integration are towards Voltage Source Converter (VSC) High Voltage Direct Current (HVDC) transmission [1]. VSC-HVDC displays distinct control and design advantages over traditional Line Commutated Converter (LCC) technology. With the increasing penetration of renewable resources and microgrids, the conventional AC distribution network is facing big challenges in plug-and-play performance and operating stability, where DC systems have more advantages. Therefore, given the demand of power system operation and success of DC technology in

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Use of Electric Spring System with Adaptive Fuzzy Logic Controller for Power Distribution Networks

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ABSTRACT

Power distribution system is a highly critical infrastructure for modern power grid. In recent years, with the large scale integration of intermittent renewable energy generation which causes instability in the power grid, the power quality problems in distribution system have earned widespread attention. Electric spring (ES), a new smart grid technology, has earlier been used for providing voltage and power stability in a weakly regulated/stand-alone renewable energy source power grid. It has been proposed as a demand-side management technique to provide voltage and power regulation. Electric springs (ES) have been proposed as a demand-response technology for improving the stability and power quality of emerging power systems with high penetration of intermittent renewable energy sources (RES). Existing ES applications mainly involve the regulations of grid voltage and utility frequency.

This project reports a power control and balancing technique for a new integrated configuration of ES and photovoltaic (PV) system, and discusses its possible use to achieve dynamic supply-demand balance in power distribution networks. The proposed system enables delivery of maximally-harvested PV power to the grid via the ES, and concurrently controls the active power consumption of its ES-associated smart load so as to achieve supply-demand power balance of the overall system in real time. In this project, it was shown that it has good low-voltage ride through ability for system disturbance or unexpected fault. There is also low impact to the utility system in comparison with active detection methods. However, a fuzzy logic control and a more accurate restrain region threshold need to be developed in order to enhance this potential technology for use within future high-penetration networks. Matlab/simulink simulations are presented in order to show the outstanding performance of the proposed design approach.

KEYWORDS: *Electric spring, power quality improvement, distribution system, fuzzy logic controller*

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I. INTRODUCTION

For a well over a century, the electrical power grid has made remarkable contributions to serve the global economic growth and improve the convenience of human life. The present power grid has been shaped in a radical structure consisting of four cascading physical elements(generation system, transmission system, distribution system,

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PI Based Coupled Inductor Circuit Breaker

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ABSTRACT

According to the paper we are developing the new type of DC circuit breaker. In order to reduce the power conversion step for future micro grid with the renewable energy source which is best for the DC power system. Therefore, according to the system components like source, load and the power conversion which can identify easy and ready to use. There the main limitation is to interrupting a current which does not have a zero crossing will sustain an arc. Here we are utilizing the short conduction path between the breaker and load along with mutual coupling to automatically and rapidly switch OFF in response to a fault. we are used BESS (battery energy storage system) for Output side to store the energy with PI controller.

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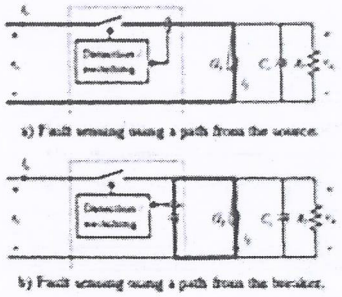
I. INTRODUCTION

According to the DC electric power which have various beneficial in the modern applications, such as electric ships, data centres, micro grids with renewable energy, and future applications such as the dc home. As researchers consider design of dc power systems, fault protection, and the circuit breaker are of significant interest. Along these lines mechanical breakers for ac systems can be used [1], but with limited range. Hybrid mechanical/solid-state breakers have been introduced [2]- [5] with the benefit of low losses. Another protection method that has been suggested is to utilize converters and associated control [6]- [9]. Alternatively, solid-state dc circuit breakers have been considered [10]. These breakers offer rapid response to faults, but tend to have higher power losses. There are various advantages of circuit breaker such as very rapid operation and automatic disconnection of faulty loads.



a) Fault sensing using a path from the source.

b) Fault sensing using a path from the breaker.

Fig.1.Fault sensing techniques.

LVDC electrical energy using renewable environmentally friendly power is frequently seen in many applications as helpfully modern. Considering the design of DC power systems, it is important to focus on fault protection and maintain the power system's DCCB. Only solid-state circuit breakers should be considered for installation and applied to these types of systems because these are the only type's breakers

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Power Quality Improvement in a Utility Grid by using Proportional Resonance Controller Based D-STATCOM

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ABSTRACT

Increasing awareness and concerns regarding unacceptable power quality are causing a growing interest in custom power devices, used to improve power quality on distribution level. One of the most interesting types of custom power devices, due to its exibility and fast control, is the shunt-connected voltage source converter (VSC), also known as the static synchronous compensator (STATCOM). A single distribution static compensator (DSTATCOM) connected at the beginning of the network working in current control mode is capable of circulating power. In this dissertation a comparative analysis has been made between the conventional proportional integral (PI) controller and proportional resonance (PR) controller. This voltage controller holds the voltage at the point of common coupling (PCC) and supplies/absorb necessary power to keep the system stability. The DSTATCOM is assumed with a battery to enable this facility. However, correcting the PCC voltage to 1 per-unit (pu) cause a large amount of reactive power to/from the utility substation. This increases the current flow in the system and increases the line loss where the R/X ratio is high. It is desired to have the least reactive power from the utility substation. A modified voltage magnitude controller can solve this problem though it changes the voltage of buses.

KEYWORDS: *D-Statcom, Frequency Compensation, Minimum Power Point Tracker, coordinated control, Distributed generation, PR controller, Voltage control.*

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I. INTRODUCTION

Distribution networks in different parts of the world have gone through significant growth and improvement with the utilization of distributed generation (DGs). This is line with the policies of government of countries towards the use of renewableenergy resources technology. Previously, the distribution system has been working on a unidirectional power flow but with the connection of DGs, the system has to accept bidirectional power flows which resulted in several technical issues such as voltage levels and power flow, protection issues, equipment thermal ratings and fault current levels [1]. One of the major concerns in the integration of DGs in the distribution systems is the voltage rise issue. This further requires the DNOs to find solutions to the overvoltage problems in ensuring that the

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A Multi Level Soft Switching with AC SPARSE Modular using ANN

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ABSTRACT

A Multilevel AC-AC Sparse modular multilevel converter (SMMC) is proposed in this paper. It is a bi-directional multilevel converter and it is employed in high power and high voltage applications. It contains full bridge and half bridge SM's on the middle arm, and low frequency converters on each side of the converter. In this converter more number of IGBT switches can work under soft switching mode. Control scheme is also proposed in this paper, it is utilized to obtain the capacitor voltage balancing. Capacitor voltages have some oscillations, harmonics will be decreased by applying modified PWM technique. Number of levels of the converter increases, voltage harmonics will be decreased and also switching frequency of the full bridge and half bridge arm IGBTs is decrease. The appropriateness of the multilevel level AC/AC SMMC with ANN Control scheme will be estimated by utilizing the MATLAB/SIMULINK software.

KEYWORDS: *SMMC, multilevel inverter, ANN*

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I. INTRODUCTION

Now a days, multilevel converters have broad range of applications in many industrial applications such as FACTS devices, HVDC lines and renewable energy resource interfaces [1] – [3]. Multilevel converters can be categarised into three types. Those are diode clamped converter(DCC), Flying capacitor converter(FCC) and Cascaded H-bridge converter(HBC). If number of levels of the converter increases, there should be a complexity in capacitor voltage adjusting in DCC, FCC requires more number of capacitor and cascaded H- bridge converter requires more number of individual dc sources [5] - [6]. To overcome such limitations of the converters, modular multilevel converter (MMC) is proposed in 2003. MMC contains low voltage switches and offering the low harmonic distortions. Now a days, MMC [7] – [9] based HVDC systems are used for transmitting the power up to GW range. MMC is also have some drawbacks, i.e more number of IGBT switches can operate under hard switching mode and circulating current is also more. To overcome such limitations of MMC, a new bi-directional converter, i.e sparse

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Modeling and Optimum Design of a Hybrid Diesel - Wind-PV-FC Based Energy Generation System

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ABSTRACT

In power systems, meeting the electricity demand of remote regions is an imperative issue. Considering economic aspects, reliability and pollution concerns, combination of diesel generator and renewable energy sources like wind turbines(WTs), photovoltaic (PV) systems and fuel cells (FCs) can be an effective way to meet the demand of off-grid loads. The micro grid system is energized with different renewable energy sources namely wind and solar PV array. However, a diesel generator (DG) set and a battery energy storage system (BESS) are also used to maintain the reliability of the system.

KEYWORDS: *hybrid energy systems, Brushless generator, composite observer, power quality, standalone micro grid.*

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I. INTRODUCTION

Diesel generators are employed in hybrid power systems to meet the electricity demand in deficit conditions. Since use of diesel fuel is costly and increases the pollution emissions, especially CO2, wind turbines (WTs) and photovoltaic (PV) systems are also regarded to reduce using fossil fuels and decrease pollutants. For a ProfessorPV/WT/diesel system, a device must be used for storing the energy. This device saves the excess energy when the renewable sources generate more energy than the load demand and delivers that to the load when the renewable energies are not enough. Although lead acid batteries are usually used for energy storage, the resultant environmental concerns limit their application. On the other hand, fuel cells (FCs) can considerably reduce the amount of the emitted greenhouse gases. Such combination (PV + WT + diesel + FC) makes a more reliable system with low pollution. Figure 1 illustrates a typical PV/WT/diesel/FC hybrid system.

Recently, using hybrid systems based on renewable sources, diesel generators and hydrogen power have received much attention. For using solar and wind resources more efficiently and economically, the optimum sizing is the main issue. For such system, optimum sizing is defined by determining the number of PV panels, WTs, and hydrogen tanks to simultaneously meet the load demand and minimize the total annual cost. If the system is optimally sized, it can be cost-effective

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Modeling and Simulink Analysis of Energy Management with Help of ANN Controller

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ABSTRACT

This project demonstrate functionality of a modeling and simulink analysis of energy management with help of ANN(ARTIFICIAL NEURAL NETWORK) controller. This is nothing but the energy management system (EMS). The EMS includes batteries and a digitally controlled single phase voltage source inverter (VSI), which can be controlled as a current source or voltage source depending on the status of the AC grid and the users preference. The EMS guarantees that the critical loads are powered when AC grid fails. In which case, the VSI is controlled as voltage source. It also accomplishes peak power control by supplying battery power to the local loads, while they are powered by AC grid if loads gets large. The DC power from the solar pannel can be transferred to the ANN controller. It converts pulsating signal to the constant signal and later it transfers to the H-bridge inverter. Then power from inverter is utilised by the AC loads, and then it transfers to AC grid. The electricity cost savings accomplished by peak savings are estimated. The Modeling and simulink analysis of energy management with the help of ANN controller is demonstrated by experimental management on MATLAB. The control architecture and logic embedded in modeling and simulink analysis of energy management with the help of ANN controller are discussed in detail.

KEYWORDS: *Renewable Energy resource, energy management system, ANN controller.*

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I. INTRODUCTION

Energy savings and energy efficiency have become top priorities all around the world, stimulated by the Kyoto protocol and other pressing needs to reduce fossil fuel consumption. Additionally, energy security is a necessity for many installations such as military bases and health care facilities where reducing energy consumption must be accomplished while keeping critical electrical loads serviced at all times. In this project, a power-electronics-based energy management system (EMS) is presented to accomplish peak power control in a single-phase power system while guaranteeing continuous service to critical loads at the same time. The EMS proposed in this project includes energy storage in the form of batteries in order to accomplish three main goals:

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Simulation of ANN Based Hybrid Power Distribution System

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ABSTRACT

AC and DC hybrid distribution network detailed modelling and multi-operation conditions of the simulation analysis will effectively support the distribution network project reliable and stable operation. However, at present, large-scale system level simulation of AC–DC hybrid distribution network based on flexible DC is the lack of timeliness and practicability. Based on the real-time digital simulation platform RT-LAB, ACDC distribution network model is established, which includes ±20 kV flexible DC interconnection system, distributed photovoltaic, wind power, energy storage system, electric vehicle and the corresponding converter control detailed modelling. In view of the limitation of the balance of energy storage system, the flexible DC interconnection is applied to active distribution network, which can provide power supply when the power gap occurs. The conditions of consumptive mode by the energy storage system, power supply through flexible DC interconnection from external power grid were simulated and analysed. The model verifies the validity of the system application in distribution network. This study provides preliminary design reference for active distribution network construction.

KEYWORDS: *AC & DC Hybrid distribution system, RT-LAB, ANN control.*

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I. INTRODUCTION

With the development of distributed energy sources (distributed generator, DG) technology and flexible DC transmission technology, the penetration of distributed energy is becoming much more higher. In order to ensure stable and reliable operation of the grid when large-scale DGs get access to the distribution network, detailed modelling and simulation analysis under different operation conditions of the whole AC/DC hybrid distribution network are necessary before the project is put into operation [1,2]. In the traditional AC/DC hybrid distribution network, there is no interconnection based on flexible DC transmission system of AC bus bars in different areas. When an AC converter station needs extra power support, the DC transmission line can transmit 1.5 times as much power as the traditional AC transmission at the same cost [3]. Also in the traditional distribution network, once an AC substation failure happens, substations connected to it will be

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I. INTRODUCTION

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ANFIS Based Single-Stage Zeta-Sepic-Based Multifunctional Integrated Converter for Plug in Electric Vehicles

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Abstract

In this paper, implementation of adaptive neuro fuzzy inference system (ANFIS) based controller for ZETA SEPIC converter is analyzed. The converter achieves all modes of vehicle operation, i.e. plug-in charging, propulsion and regenerative braking modes with wide voltage conversion ratio (M) in each mode. And it has least components compared to those existing converters which have stepping up and stepping down capability in every mode. In the case of plug in electric vehicles, the charging/discharging between vehicle and grid is not coordinated; also uncoordinated charging/discharging will increase the losses in the network. Therefore ANFIS based controller is designed and better control is achieved for the different conditions of electric vehicle's battery and the distribution network. It is proved that the proposed ANFIS based controller improves the grid stability by flattening the load profile and reduces power losses. It is also found that the transient response of the ANFIS based controller is better than fuzzy and PI controller. fuzzy logic controller is useful for the improvement of driving performance, it also makes the hybrid vehicles achieve good fuel economy and low emissions performance.
Keywords: *ANFIS-Adaptive neuron Fuzzy interfacing Machine, electric Vehicle, ZETA-SEPIC converter.*

INTRODUCTION

Those electric motors or plug-in electric vehicles (PEVs) would presently An guaranteeing reaction to control the air sullying that makes utilization of sullying unfastened battery ability will make smooth birch vitality to those car [1]. The PEVs would mix of on-board charger, battery, and the inverter-pressure framework [2–5].

Previously, greater bit from claiming PEVs, a bidirectional dc/dc converter is interfaced the middle of the battery and dc-connection from claiming gadget inverter [6–8] for vitality stream toward a few stage in power Also regenerative braking pastime. Thusly, an unique cooling/dc converter will be used to rate the battery starting with those gadget side. In those prevailing time, two separate energy advanced converters would needed for 2 detached exercises (charging What's more freeing of the battery). The bidirectional dc/dc converter for standard structure might a chance to be incorporated with those on-board charger, on need person weight contraptions interface for entire enthusiasm for PEVs. Those great referred to rectangular graph of a facilitated charger with absolute drive electronic is affirmed dependent upon for fig. 1a. This coordination diminishes the measure of segments because that a section of the switches Also inductors would connected every done cooling/dc What's more dc/dc phases. Hence, diminished number from claiming switches and inductors prompt better compel thickness, minimized length and bring down expense. Toward those introduce time, paper proposes, whatever available ZETA-SEPIC-based completely included converter to PEVs, Likewise affirmed dependent upon Previously, fig. 1b which need buck/bolster possibility clinched alongside each methodology to action. Moreover, buck/bolster pastille over every mode grants commitment for tremendous scope of the battery voltage, profitable control for dc-connect voltage Furthermore getting those regenerative braking for An totally mixed bag of the motor pace.

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PV WATER PUMPING SYSTEM USING ANFIS CONTROLLER BASED INDUCTION MOTOR DRIVE

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Abstract

A basic and proficient sun based photovoltaic (PV) water pumping system using an induction motor drive (IMD) is introduced right now. This solar powered PV water pumping system contains two phases of intensity change. The primary stage removes the greatest force from a sunlight based PV exhibit by controlling the obligation proportion of a DC-DC help converter. The DC transport voltage is kept up by the controlling the engine speed. This guideline helps in decrease of engine misfortunes on account of decrease in engine flows at higher voltage for same influence infusion. To control the obligation proportion, a gradual conductance (INC) based greatest force point following (MPPT) control method is utilized.This article presents the Adaptive Neuro-Fuzzy Inference System based VECTOR Control for Enlistment engine combined with centrifugal pump. VECTOR Control is an innate shut circle control with less intricacy, dynamic torque and speed. In the variable torque applications like pumps when speed of engine changes, the torque created by the pump additionally differs correspondingly. To diminish the waves in torque and to improve the reaction of the control calculation, Adaptive Neuro-Fuzzy Inference System (ANFIS) is executed alongside DTC. Conversely with the Fuzzy logic based DTC, the proposed ANFIS based DTC has altogether decreased waves in transition, torque and stator current. The consequences of the proposed ANFIS-DTC are approved through the Matlab reproductions and the exhibition of the system is discovered good when it is tried with various rotational velocities.
Keywords: Adaptive Neuro-Fuzzy Inference System (ANFIS), Centrifugal pump, Direct Torque Control (DTC), and Variable Frequency Drives (VFD).

I. INTRODUCTION

The climbing vitality crises All around the globe Furthermore contamination from claiming characteristic habitats, bring been looking for consideration from building Furthermore science society since couple of decades. Those information to show fate for renewable vitality wellsprings under helpful form, need been maturing quickly. Those approach from claiming quick exchanging force electronic units What's more improvemen in semiconductor technology, bring majorly helped vitality transformation strategies. Those renewable vitality utilization, which began from converting the vitality for running water, need voyaged over should change over sun oriented vitality on electrical vitality specifically today. Sun based photovoltaic (PV) vitality converters prior need been wasteful for the effectiveness Likewise low as 5-6 % and exceedingly unreason ability [1]. However, for expanded mechanical transformation Scrutinize Furthermore advancements, the effectiveness for PV array, during present, need arrived at 15-16%. Moreover, those costs have been diminishing bit by bit. Today, PV vitality transformation is seen as a standout amongst the guaranteeing plan B on fossil fuel based power generating systems, Likewise there would no harmful emissions, no greenhouse gasses emission, no fuel expense involvement, any rate as upkeep cost, no water use and so forth. However, those innovation is for creating period Furthermore there need aid a number tests which requirement on a chance to be tended to such as, intermittency, helter skelter introductory cosset What's more low effectiveness.

The systems used to control velocity Furthermore torque of the incitement engine would arranged concerning illustration scalar What's more vector control strategies [3-8]. Those scalar control method

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Dead-Beat Control Based Active and Reactive Power Control for Applications of Single-Phase Electric Springs

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Abstract

The idea of electric springs (ESs) has been proposed as another answer for balancing out power network took care of by discontinuous renewable energy sources. With a battery or dynamic power source (DC, within), the ESs can give both dynamic and responsive power remunerations. Up until now, three regular topologies of single-stage ESs have been accounted for. Not at all like conventional gadgets where power age follows the load request, ESs are related with non-critical loads from the purported smart loads that move the changed power to the non critical loads, adaptively ,as indicated by the discontinuous idea of power age. Subsequent to investigating principle control systems of single-stage ESs, the paper breaks down their favorable circumstances and weaknesses just as their appropriate applications. Correlations among various control methodologies on a particular topology adaptation are executed.

Keywords:*Single Phase Electric Springs, ESs*

I. INTRODUCTION

Acquaintance. These days, with those stretching and only energy made from the renewable vitality sources (RESs) Furthermore infused under energy framework, soundman issues turns out to make progressively more amazing due to res unpredictability versatile trading current transmission frameworks need aid used should control voltage or energy stream. At any rate an expansive parcel for them need aid suitable to high-or medium-voltage applications, and can't make used to future low-voltage more diminutive scale lattices for helter skelter res infiltration, for example, top photovoltaic(PV) and little force rating wind plants. Will adjust should this need , those electric spring (ES) improvement need been suggested to future appropriated littler scale networks to move those offering voltage progressions of the expected non-critical loads (NCL) i. E of the loads that continue an immense stock voltage go, in place will stay with controlled those voltage over purported discriminating loads(CLs), Case in point those loads that continue thin stock voltage try. The return happens through a programmed equality of the load appeal with the force period performed Eventually Tom's perusing es. The situated settled on for es and NCLs frames affirmed advanced mobile load (SL). The voltage over CLs Also to rise to sl is hence doled out for grid voltage. Up until now, various papers are indicated dependent upon coating es topologies What's more there control frameworks. The principle variant (ES1) for might simply manage the open control same time the ensuing version (ES-2) over camwood manage both those progressive Also receptive force Concerning illustration those capacitor in the dc side of es will be supplanted Toward An voltage sourball such as a battery pack. The third version(ES-3) over will be an alternate sort es without NCL those so-sequenced fourth manifestation (ES-4) in transforms those exhibitions for es enormously, since it urges the NCL voltage will movement over a comparative route Similarly as those offering voltage Toward those support of the consideration for a additional transformer in the initial ES-2.

Previous meets expectations have uncovered different control arrangements of the ES-2. To cases. Proposes those control of the illumination present by turning of the dq0-change.

This arrangement, be that Likewise it may, can't keep unalterably those grid voltage Concerning illustration it will be guided clinched alongside a open-circle mode. In any case from claiming if An close circis siliquastrum with An relative essential (PI) controller may be included on regulate the grid

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ANFIS BASED BIDIRECTIONAL DC/DC CONVERTER WITH DUAL-BATTERY ENERGY STORAGE FOR HYBRID ELECTRIC VEHICLE SYSTEM

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Abstract

The consideration toward the improvement of different new forms of bidirectional DC to DC converters has gotten so fundamental inside the ongoing years on account of their necessity in Cross breed electric fueled engines, inexhaustible force structures, instructive investigations and other modern applications. Regarding the matter of this present need, the proposed Bi-Directional DC to DC converter (BDC) is executed as an interface among a prime vitality Energy Source (ES1), an assistant power stockpiling Energy Source (ES2), and a dc-transport link of different voltage stages, for use of the equivalent in the Cross breed electric vehicle frameworks. The proposed converter can act in a stage up mode (i.e., low-voltage dual source powering mode) and a stage down mode (i.e., high-voltage dc bus energy-regenerating mode), each with bidirectional force drift control and a Buck/Boost mode where the adaptation can autonomously oversee vital power transferability between the two low-voltage sources (i.e., low-voltage dual-source Buck/Boost mode). Thus, the circuit arrangement, activity, predictable state investigation, and Feedback control of the proposed BDC are represented with its detailed description of 3 methods of working where the computer based intelligence procedure of Versatile Artificial Neuro-Fuzzy Inference System (ANFIS) is utilized for delivering the highest quality level control of band pulses to improve the working ability. Inside the ANFIS approach, the slip-up voltage and exchange error voltage are given as information sources and thus the ANFIS controller is utilized to diminish the cost and pass on the upgraded advantage levels. It is noticeable that the usage of the proposed controller improves the productivity of the system and decrements the voltage drop over the exchange of energy activity. The proposed ANFIS strategy with bidirectional converter topology implemented in MATLAB/Simulink running stage and the yield generally speaking as execution is examined.

Key phrases: *ANFIS , bidirectional DC–DC converter , Zero-Voltage Switching (ZVS) , synthetic neural community and fuzzy -logic controller.*

I. INTRODUCTION

As of late, there's a developing requirement for top force change viability with the expanded utilization of vitality stockpiling gadgets, which is basic for each single working condition in an assortment of uses. With meet this prerequisite, bidirectional DC-DC convertors need aid comprehensively used which have dc voltage transports that require aid upheld dependent upon Toward Vitality stockpiling Frameworks almost like batteries. Previously, whichever course, those bidirectional DC-DC converters would used with move the facility between two dc sources. Secondary dependability, helter skelter viability, minimized span What's more lightweight would those the overwhelming majority tremendous necessities of the bidirectional DC-DC converters. The bidirectional dc converters need aid divided under non-segregated What's more disengaged circuits relying upon those provisions. The non-separated converters are that's only the tip of the iceberg moderate over the disengaged ones as they need lesquerella dynamic switches Also reserved parts are also used thanks to their clear structure Furthermore control plot. Non-segregated bidirectional converters are distinctively connected with coupled inductors which enable those converter on have an awesome voltage transform extent that keeps those commitment cycle getting exorbitantly dainty (when those converter are going to be within the buck-method from claiming activity), or exorbitantly totally (when the converter are going to be within the lift system for movement). Those viability for

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Fault identification in a distribution network using AI Techniques

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Abstract

In this paper a new automated fault location method by using radial basis function neural network (RBFNN) for a distribution network with DGs has presented. The three phase currents of one end are taken as inputs in the proposed scheme The suggested approach is able to determine the accurate type and location of faults using RBF neural network. Several case studies have been made to verify the accuracy of the proposed method for fault diagnosis in a distribution system with DGs using a MATLAB. Results showed that the proposed method can accurately determine the location of faults in a distribution system with several DG units.

***keywords*– Fault Location; Distributed Generation (DG); Distribution Network; Radial Basis Function Neural Network (RBFNN).**

I INTRODUCTION

The electrical power system consists of so many different complex dynamic and interacting elements, which are always prone to disturbance or an electrical fault. The use of high capacity electrical generating power plants and concept of grid, i.e. synchronized electrical power plants and geographical displaced grids, required fault detection and operation of protection equipment in minimum possible time so that the power system can remain in stable condition. The faults on electrical power system transmission lines are supposed to be first detected and then be classified correctly and should be cleared in least fast as possible time. The protection system used for a transmission line can also be used to initiate the other relays to protect the power system from outages. A good fault detection system provides an effective, reliable, fast and secure way of a relaying operation. In recent times, fault location methods have been developed by considering DGs in a distribution network [4]. A fault location algorithm for a distribution system with DGs has been developed by using current measurements [5-6]. In this method, after a faulted segment is located, islands are formed involving groups of DGs and a load shedding scheme is implemented to match the loads with the DGs generating capability in the island. A method for finding the location of faults in a network with DG has been developed based on software procedures which require a telecommunication control system [7]. Another fault location method is based on the estimates of the fault impedance by measuring current and voltage at a substation [8]. In this method, the fault location performance is inaccurate when a DG is located upstream of the fault section where the impact is more severe for synchronous machine based DG. An asymmetric fault location method using a communication system has been developed by identifying the direction of an asymmetrical fault based on negative sequence current scalar product [9]. Here, an asymmetrical fault line searching and locating scheme is implemented by combining the fault direction distinguishing method with its communication system. A more recent fault location method for a distribution network with DG units considers the application of multi layer perceptron neural network (MLPNN) [10-11]. However, considering the structure and training algorithm of the MLPNN, the speed of this method is not suitable for fast and accurate fault location.

This paper presents an automated fault location scheme for a distribution network with DGs using the radial basis function neural network (RBFNN). RBFNN is considered to be a better neural network model for solving engineering problems. The proposed scheme determines the fault type by normalizing the fault current of the main source whereas the location of faults is determined by using two RBFNNs. The first RBFNN determines the fault distance from each DG units and the main source

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MAXIMUM POWER POINT TRACKING APPROACH FOR PV MODULES USING MOTH FLAME OPTIMIZATION

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Abstract

Photovoltaic framework (PV) has gigantic potential because of the luxuriousness of sun based vitality. Maximum Power Point Tracking (MPPT) calculation is essentially expected to keep the PV framework worked at ideal point. MPP in a PV framework improves the general framework use productivity with maximum power. Right now and examination of MPPT calculations for PV framework is communicated. The moth flame optimization based MPPT calculation is proposed right now. MFO MPPT is a straightforward calculation and the reaction of the looking is increasingly dependable. MFO based MPPT method is utilized to follow the maximum power working point under quickly changing insolation state of the PV framework. The duty factor is given by the MFO calculation is given to the stepup converter to direct and to give maximum accessible power to the heap. A wide range of ways to deal with MPPT have been proposed. These procedures might be very powerful for tracking a nearby MPP, for example, the Perturb and Observe (P&O) and Incremental Conductance (InC) strategies, or might be intended to decide the worldwide maxima, for example, the Particle Swarm Optimization (PSO) and MFO techniques

Key Terms: *Maximum Power Point Tracking, Moth flame optimization strategy, Photovoltaic.*

I. INTRODUCTION

As of late, the utilization of electrical vitality age frameworks dependent on inexhaustible assets has expanded because of natural concerns, compelled non-renewable energy source assets, legislative motivators, and so on. One of the most well-known sustainable electrical vitality frameworks is the photovoltaic (PV) framework. A test in these frameworks, as in numerous sustainable power source frameworks, is safeguarding maximum productivity during quick changes in climate conditions. To expand the effectiveness of PV frameworks, scientists have concentrated on three principle themes [1]: (a) structuring sun based irradiance tracking frameworks, (b) actualizing proficient power converters, and (c) creating maximum power point tracking (MPPT) calculations. The initial two are primarily considered in structuring and putting in new PV frameworks, while MPPT calculations can possibly be utilized in both new and existing PV frameworks [1].

A MPPT calculation ought to alter the working point of a PV framework to such an extent that its yield electrical power is amplified [2]. PV frameworks are associated with loads by means of DC-DC converters liable for MPPT [3]. In fact, the yield of MPPT calculations can be the reference current, reference voltage, or obligation pattern of the Pulse width regulation (PWM) controller of DC-DC converters, and the working point of PV frameworks can be controlled and balanced through these parameters [4]. Under uniform irradiance, the power-voltage (P-V) bend of PV frameworks has just a single maximum power point (MPP) which changes with temperature and irradiance varieties. It is the undertaking of MPPT calculations to discover new ideal working points in accordance with these varieties. Some regular MPPT calculations proposed for this reason incorporates P&O [5], incremental conductance [6, 7, 18], extremum-chasing control [8], and swell connection control [9].

Particle Swarm Optimization (PSO) [10-12] has been proposed as a GMPPT strategy dependent on the conduct of fish tutoring and winged creatures rushing [13]. Right now all in all take care of an issue by sharing data to locate the best arrangement. The procedure is restricted by the nearness of

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Grid Connected PV based Buck & Boost converter for Mismatched Environmental Conditions using FUZZY & PSO

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Abstract

Right now, rationale based MPPT figuring for PV clusters in puzzled environmental conditions is proposed. A single phase grid related transformer less photo voltaic (PV) inverter which can work either in buck or in boost mode, and can isolate maximum power simultaneously from two consecutively related sub exhibits while every one of the sub cluster is going up against various regular conditions like temperature and insolation, is shown right now. As the inverter can work in buck similarly as in boost mode depending upon the essential, the confinement on the base number of consecutively related sun based PV modules that is required to outline a sub exhibit is immensely reduced. Appropriately power yield from every one of the sub cluster increases when they are introduced to different common conditions. The topological setup of the inverter and its control method are organized so the high recurrence segments are missing in the ordinary mode voltage thusly keeping the enormity of the spillage current related with the PV exhibits inside beyond what many would consider possible. Further, high working profitability is practiced every single through it working reach. A point by point assessment of the framework provoking the progression of its numerical model is finished. The appropriateness of the arrangement is confirmed by performing point by point recreation inspects. The vast majority of the current MPPT calculations experience the ill effects of the disadvantage of being moderate following. Because of this, the use effectiveness is decreased. The different strategies for maximum power point procedure calculations, for example, PSO, Steady Conductance (INC) and Perturb and observe (P&O).

Keywords—*Grid connection, Single phase, Transformerless, Buck and Boost based PV inverter, Maximum power point, PSO, Mismatched environmental condition, Series connected module.*

I. INTRODUCTION

Likewise those world characteristic assets are diminishing day by day, will help the increment in the control demand, those energy segment is taking a gander at exchange vitality assets.

Because of use from claiming renewable vitality sources, those carbon substance in the environment might a chance to be decreased Eventually Tom's perusing which worldwide warming issue might be beat. Crazy about Different renewable sources, sun oriented PV framework may be heading adrift these days because of its basic structure. The Different structure for PV board framework and its suitable for areas have been. Examined [1–7]. Those effectiveness of the PV framework might a chance to be expanded by utilizing force electronic units alongside most extreme energy perspective controller. The extraction from claiming most extreme accessible control starting with a photovoltaic module is done toward greatest energy purpose following controller. Those effectiveness of the photovoltaic framework might a chance to be considerably expanded by utilizing most extreme control purpose tracker (MPPT). A few calculations need aid produced with track the most extreme energy purpose proficiently. Mossycup oak of the existing MPPT calculations fair starting with those detriment about being moderate following. Because of this, those usage effectiveness will be diminished. Those different systems for most extreme control purpose strategy calculations for example, incremental conductance (INC) and bother What's more perception (P&O). The major concern of a photograph voltaic (PV) framework may be to guarantee ideal execution about distinct PV modules to An PV show same time the modules would uncovered with different Ecological states emerging because of Contrast in insolation level or distinction previously, working temperature. Those vicinity for befuddle clinched alongside working state for modules altogether

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FUZZY LOGIC BASED SINGLE-STAGE ZETA-SEPIC CONVERTER FOR PLUG IN ELECTRIC VEHICLES

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Abstract:

A single-stage-based integrated power electronic converter has been proposed for plug-in electric vehicles (PEVs). In this paper we are using fuzzy controller comparing to pi controller due to some advantages. The fuzzy logic controller is the most suitable for the human decision-making mechanism, providing the operation of an electronic system with decisions of experts. The ZETA-SEPIC- converter achieves all modes of vehicle operation, i.e. plug-in charging, propulsion and regenerative braking modes with wide voltage conversion ratio (M) in each mode. Therefore, a wide variation of battery voltage can be charged from the universal input voltage (90–260 V) and allowing more flexible control for capturing regenerative braking energy and dc-link voltage. Fuzzy control has been used for switching pulse generation in the converter. The topology has been simulated in MATLAB2016a and the various waveforms were analyze to find THD and power factor.

Keywords : pulse width modulation (PWM), plug-in electric vehicles (PEVs), power factor correction (PFC)

I. INTRODUCTION

The electric vehicles or plug-in electric vehicles (PEVs) are now a promising solution to curb the air pollution that uses pollution-free battery power to produce clean energy for the vehicle [1]. The PEVs are combination of on-board charger, battery, and the inverter-drive system [2–5]. In majority of PEVs, a bidirectional dc/dc converter is interfaced between the battery and dc-link of machine inverter [6–8] for power flow during propulsion and regenerative braking operation. Therefore, an individual ac/dc converter is used to charge the battery from the grid side. In this conventional structure, two separate power electronic converters are needed for two independent operations (charging and discharging of the battery). The bidirectional dc/dc converter in conventional structure can be integrated with the on-board charger, to have one power electronics interface for complete operation of PEVs. The overall block diagram of an integrated charger with single power electronic is shown in Fig. 1a. This integration reduces the number of components because some of the switches and inductors are utilised both in ac/dc and dc/dc stages. Therefore, reduced number of switches and inductors lead to higher power density, compact size and lower cost. In this regard, this paper proposes, a new ZETA-SEPIC-based integrated converter for PEVs, as shown in Fig. 1b which has buck/boost capability in each mode of operation. In addition, buck/boost operation in each mode allows selection of wide range of the battery voltage, efficient control of dc-link voltage and capturing the regenerative braking with a wide variation of the motor speed.

II. OPERATION OF THE PROPOSED CONVERTER

Operation of the proposed converter The proposed integrated converter operates in three modes: battery charging from the grid (plug-in charging), propulsion, and regenerative braking of charging. In the following section, operation of converter is discussed in detailed manner

PV Water Pumping System Using fuzzy logic controller based Induction Motor Drive

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ABSTRACT

Recently, the solar energy has become an alternative source of energy of great importance. Divers researches and efforts have been concentrated on the photovoltaic (PV) systems efficiency improvement and the accessibility to this technology. In order to perform this goal a special interest was focused on the fuzzy algorithm based on the Sugeno inference model. This paper presents a detailed study and design of a MPPT controller to insure a high PV system performance which can be selected for practical implementation issue. A simulation work dealing with MPPT controller, a DC/DC boost converter feeding a DC motor-pump is achieved. Significant extracted results are given to prove the validity of the proposed overall PV pumping system.. The proposed control scheme makes the system inherently immune to the pump's constant variation. The prototype of PV powered IMD emulating the pump characteristics, is developed in the laboratory to examine the performance under different operating conditions. a Fuzzy Logic Controller (FLC) is introduced. The validity and the effectiveness of the proposed FLC is tested and confirmed by a simulation under various climate changes.

Index Terms— PV, MPPT, fuzzy, DC motor and pump

INTRODUCTION

In the modern area of development, renewable resources of energy, are being advocated by many countries to meet the increasing demand of electrical energy due to rapid depletion of non-renewable resources. Solar PV based energy generation, has come up as an important alternative for many purposes . The irrigation sector is one of the major sectors where solar PV power is extensively used for water pumping . Solar PV water pumping has been initially realized using the DC motor. However, with all due virtues associated with the induction motor in terms of mechanical simplicity, ruggedness, reliability, low cost, higher efficiency and lower maintenance than the DC motors, it has replaced DC motors. Here, a solar PV array fed induction motor drive using vector control is used . As one knows that solar PV power depends on solar insolation and temperature. The characteristic of PV module exhibits a single power peak.

The rising energy crises throughout the world and pollution of natural habitats, have been seeking attention from engineering and science fraternity since couple of decades. The knowledge for manifestation of renewable energy sources into useful form, has been maturing rapidly. The advent of fast switching power electronic devices and development in semiconductor technology, have majorly contributed to energy conversion methods. The renewable energy utilization, which started from converting the energy of running water, has travelled across to convert solar energy to electrical energy directly today. Solar photovoltaic (PV) energy converters earlier have been inefficient with the efficiency as low as 5-6 % and highly costly [1]. However, with increased technological research and advancements, the efficiency of PV array, at present, has reached 15-16%. Moreover, the prices have been reducing gradually. Today, PV energy conversion is viewed as one of the promising alternatives to fossil fuel based electricity generating systems, as there are no toxic emissions, no greenhouse gases emission, no

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Fuzzy Logic Based Active and Reactive Power Control for Applications of Single-Phase Electric Springs

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ABSTRACT

Aiming at effective power management in micro grids with high penetration of renewable energy sources (RESs), the paper proposes a simple power control for the so-called second-generation, single-phase electric springs (ES-2), that overcomes the shortcomings of the existing ES control methods. By the proposed control, the unpredictable power generated from RESs is divided into two parts, i.e. the one absorbed by the ES-2 that still varies and the other injected into the grid that turns to be controllable, by a simple and accurate signal manipulation that works both at steady-state and during RES transients. It is believed that such a control is suitable for the distributed power generation, especially at domestic homes. In the paper, the proposed control is supported by a theoretical background. Its effectiveness is at first validated by simulations and then by experiments. To this purpose, a typical RES application is considered, and an experimental setup is arranged, built up around an ES-2 implementing the proposed control. Testing of the setup is carried out in three steps and proves not only the smooth operation of the ES-2 itself, but also its capability in running the application properly. Therefore, the intelligent control approach using fuzzy concept is more accurate and faster than the PI control even for complex dynamical system.

INTRODUCTION

Centralized control is adopted in the existing power system where power generation mainly depends on the load prediction. Nowadays, with the increasing portion of power generated from the renewable energy sources (RESs) and injected into the power system, stability issues become more and more severe due to the RES intermittency. Flexible alternating current transmission systems are used to control voltage and/or power flow . However, most of them are suitable for high- or medium-voltage applications, and cannot be used for future low-voltage microgrids with high RES penetration, such as roof photovoltaic (PV) and small power-rating wind plants . To cope with this need, the electric spring (ES) technology has been proposed for future distributed micro grids to transfer the line voltage fluctuations to the so-called non-critical loads (NCLs) , i.e. to the loads that tolerate a large supply voltage range, so as to keep regulated the voltage across the so-called critical loads (CLs), i.e. the loads that tolerate a narrow supply voltage range. The transfer occurs through an automatic balance of the load demand with the power generation, performed by ES. The set made of ES and NCLs forms the so-called smart load (SL).

. In present days, small distributed power stations are built closer to the intermitted renewable energy sources of low ratings which can supply power to solar houses, hybrid cars etc., by providing efficient power to the loads. A spring is a rigid object which repels based on their applications, that works on the principle of HOOKE's law [2]. Spring is made of high yield strength elastic material to restore energy. Electric spring is analogues to the mechanical spring. Generally a spring can be used as a storage device, for reducing the effect of shocks and vibrations, pollution free, easy maintenance. In daily life, applications of spring are pogo stick, trampoline, and spring mattresses. Electric spring helps to provide continuous voltage for non-critical loads such as house-hold appliances. Whenever there is more

FUZZY LOGIC BASED BIDIRECTIONAL DC/DC CONVERTER WITH DUAL-BATTERY ENERGY STORAGE FOR HYBRID ELECTRIC VEHICLE SYSTEM

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ABSTRACT

A new multi-input dc-dc converter with fuzzy control based upon the hybrid energy system is proposed in this paper. In this paper we are using fuzzy controller comparing to other controller due to some advantages. The fuzzy controller is the most suitable for the human decision-making mechanism, providing the operation of an electronic system with decisions of experts. The proposed converter can be used for transferring energy between different energy resources. The proposed converter operation classified into two modes i.e. Battery charging mode and battery discharging mode. In charging mode main energy system supplies to load and also delivers power to the rechargeable energy storage systems and in discharging mode all input sources deliver power to output. The proposed converter is used for controlling the power of ESSs by allowing active power sharing. The voltage levels of utilized ESSs can be higher or lower than the output voltage. By using the fuzzy controller for a nonlinear system allows for a reduction of uncertain effects in the system control and improves the efficiency. By using the simulation results we can analyze the novel bidirectional non-isolated multi-input converter (MIC) topology for hybrid systems to be used in electric vehicles.

INTRODUCTION

Recently bi-directional dc-dc converters are widely researched and developed for various applications such as battery charger-dischargers, electric vehicles and UPS systems. In case of the battery fed electric vehicles (BFEVs), electric energy flows between motor and battery side. For achieving zero emission, the vehicle can be powered only by batteries or other electrical energy sources. Batteries have widely been adopted in ground vehicles due to their characteristics in terms of high energy density, compact size, and reliability. This can be applied in Hybrid Electric Vehicle (HEVs) with a battery as an energy storage element to provide desired management of the power flows. In hybrid electric vehicle energy storage devices act as catalysts to provide energy boost. However the high initial cost of BFEVs as well as its short driving range has limited its use. Bidirectional dc-dc converters are the key components of the traction systems in Hybrid Electric Vehicles. The use of a Bi-directional dc-dc converter fed dc motor drive devoted to electric vehicles (EVs) application allows a suitable control of both motoring and regenerative braking operations, and it can contribute to a significant increase the drive system overall efficiency.

A functional diagram for a typical (FCV/HEV) power system is illustrated in Fig. 1 [4, 13]. The low-voltage FC stack is used as the main power source, and SCs directly connected in parallel with FCs. The dc/dc power converter is used to convert the FC stack voltage into a sufficient dc-bus voltage in the driving inverter for supplying power to the propulsion motor. Furthermore, ES1 with rather higher voltage is used as the main battery storage device for supplying peak power, and ES2 with rather lower voltage could be an auxiliary battery storage device to achieve the vehicle range extender concept [13]. The function of the bidirectional dc/dc converter (BDC) is to interface dual-battery energy storage with the dc-bus of the driving inverter

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RENEWABLE ENERGY BASED FAULT IDENTIFICATION IN A IEEE15 BUS DISTRIBUTION NETWORK

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Abstract

In this paper new issue area strategy by utilizing spiral premise work neural system (RBFNN) for a conveyance coordinate with DGs has introduced. The two stage flows of one end are taken as contributions to the proposed conspire. The recommended approach can decide the precise kind and area of flaws utilizing RBF neural system. A few contextual analyses have been made to confirm the precision of the proposed technique for shortcoming finding in a circulation framework with DGs utilizing a MATLAB. Results indicated that the proposed strategy can precisely decide the area of shortcomings in a dissemination framework with a few DG units.

***Keywords**-- Fault Location; Distribution Network; Radial Basis Function Neural Network (RBFNN).*

I INTRODUCTION

The electrical force framework comprises of such a large number of various complex dynamic and interfacing components, which are constantly inclined to unsettling influence or an electrical flaw. The utilization of high limit electrical producing power plants and idea of matrix, for example synchronized electrical force plants and geological uprooted frameworks, required deficiency recognition and activity of assurance gear in least conceivable time with the goal that the force framework can stay in stable condition. The deficiencies on electrical force framework transmission lines should be first identified and afterward be arranged effectively and ought to be cleared in least quick as conceivable time. The insurance framework utilized for a transmission line can likewise be utilized to start different transfers to shield the force framework from blackouts. A decent issue discovery framework gives a successful, solid, quick and secure method for a handing-off activity.

Lately, flaw area strategies have been created by considering DGs in a conveyance arrange. A deficiency area calculation for an appropriation framework with DGs has been created by utilizing current estimations. Right now, a blamed fragment is found, islands are framed including gatherings of DGs and a heap shedding plan is executed to coordinate the heaps with the DGs producing capacity in the island. A technique for finding the area of flaws in a system with DG has been created dependent on programming methodology which require a media transmission control framework. Another issue area technique depends on the evaluations of the shortcoming impedance by estimating current and voltage at a substation. Right now, issue area execution is wrong when a DG is found upstream of the shortcoming segment where the effect is increasingly serious for synchronous machine based DG. A topsy-turvy flaw area technique utilizing a correspondence framework has been created by distinguishing the bearing of a deviated deficiency dependent on negative succession current scalar item [9]. Here, an awry separation point looking and finding plan is executed by consolidating the issue bearing distinctive strategy with its correspondence framework. A later shortcoming area technique for a conveyance coordinate with DG units considers the utilization of multi layer perceptron neural system (MLPNN). In any case, thinking about the structure and preparing calculation of the MLPNN, the speed of this strategy, isn't reasonable for quick and precise deficiency area.

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COMPARATIVE ANALYSIS OF MPPT BASED GRID CONNECTED PV SYSTEM USING FS-MPC

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ABSTRACT:

Solar energy is a potential energy source .A photovoltaic is needed to harvest this kind of energy, and to be able to gather the most, the PV must have a good efficiency. The maximum efficiency is achieved when PV works at its maximum power point which depends on irradiation and temperature. Since the irradiation and temperature always change with time, a PV system which able to track the maximum power point needs to be developed to produce more energy. This research was aimed to explore the performance of a maximum power point tracking system which implements Incremental Conductance (InC) method. The InC algorithm was designed to control the duty cycle of Buck Boost converter and to ensure the MPPT work at its maximum efficiency. The system performance of InC algorithm was compared to widely used algorithm - Perturb and Observe (P&O) on a Simulink environment. From the simulation, the IC method shows a better performance and also has a lower oscillation. The proposed method is compared with the conventional MPPT method Perturb and Observe (P&O) under different irradiance variations. The three-phase, two-level voltage source inverter (VSI) is controlled by a finite set model predictive controller (FS-MPC). The simulation results show that the proposed system is more efficient than the conventional method and has good dynamic performances.

Keywords: Photovoltaic (PV) System, Maximum Power Point Tracking (MPPT), Maximum Power Point (MPP), Perturb and observe (P&O), Incremental Conductance method (InC), Boost Converter

I. INTRODUCTION:

The non-renewable sources are reducing day by day also their cost increases rapidly and on other side the requirement of electric energy increases in large percentage, so we need renewable energy sources like wind, solar, fuel cell etc. In this thesis solar energy is used because of its advantages and right now this is attractive and economical option. In solar power plants solar cells convert sun light directly into electrical energy. This energy is transferred entirely to an appropriate power grid with the help of various power electronic convertor devices and power transmission network. As we know that solar irradiation does not remain constant continuously, it changes through the day, and because of this under such condition we do not get the maximum power. So for resolving this problem we need to use the method or algorithm of maximum power point tracking (MPPT) for the variable temperature and solar irradiation conditions so that maximum energy will be generated.

Many solutions for maximizing the output power of PV modules have been presented in the literature [2, 3]. The most commonly used techniques such as perturb and observe [4, 5], incremental conductance [6, 7] and hill-climbing algorithms [8, 9], are valued for the simplicity of their implementation. However, these conventional methods have various drawbacks, like slow tracking, steady-state oscillations at maximum power points and low efficiency. To overcome those disadvantages, many scientific researchers have used artificial intelligence techniques, including neural networks (NN) [10] and fuzzy logic control (FLC) [11, 12, 13]. Recently, bio-inspired metaheuristic methods have been applied to the problem of maximum power point tracking (MPPT). Some of these techniques are particle

Grid Connected PV based Buck & Boost converter for Mismatched Environmental Conditions using PSO MPPT

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ABSTRACT-In this paper, a molecule swarm improvement (PSO)- based MPPT calculation for PV arrays in confounded ecological conditions is proposed. A solitary phase grid associated transformer less photograph voltaic (PV) inverter which can work either in buck or in boost mode, and can separate maximum power at the same time from two sequentially associated subarrays while each of the sub array is confronting diverse natural conditions like temperature and insolation, is displayed in this paper. As the inverter can work in buck just as in boost mode relying upon the prerequisite, the limitation on the base number of sequentially associated solar PV modules that is required to frame a sub array is enormously diminished. Accordingly power yield from each of the subarray increments when they are presented to various natural conditions. The topological configuration of the inverter and its control procedure are structured so the high frequency components are absent in the regular mode voltage consequently confining the greatness of the leakage current related with the PV arrays inside as far as possible. Further, high working productivity is accomplished all through its working reach. A point by point examination of the system prompting the advancement of its mathematical model is completed. The suitability of the plan is affirmed by performing point by point simulation examines. Most of the existingMPPT algorithmssuffer from the drawback of being slow tracking. Due to this, the utilization efficiency is reduced. The various methods of maximum power point technique algorithms such as Incremental Conductance (INC) and Perturbation and Observation (P&O).

Index Terms—Grid connection, Single phase, Transformerless, Buck & Boost based PV inverter, Maximum power point, PSO, Mismatched environmental condition, Series connected module.

I.INTRODUCTION

The major concern of a photo voltaic (PV) system is to ensure optimum performance of individual PV modules in a PV array while the modules are exposed to different environmental conditions arising due to difference in insolation level and/or difference in operating temperature. The presence of mismatch in operating condition of modules significantly reduces the power output from the PV array [1]. The problem with the mismatched environmental conditions (MEC) becomes significant if the number of modules connected in series in a PV array is large. In order to achieve desired magnitude for the input dc link voltage of the inverter of a grid connected transformerless PV system, the requirement of series connected modules becomes high. Therefore, the power output from a grid connected transformerless (GCT) PV system such as single phase GCT (SPGCT) inverter based systems derived from H-bridge [2], [3] and neutral point clamp (NPC) inverter based systems [4], [5] get affected significantly during MEC.

In order to address the problem arising out of MEC in a PV system, various solutions are reported in the literature. An exhaustive investigation of such techniques has been presented in [6]. Power extraction during MEC can be increased by choosing proper interconnection between PV modules [6], [7] or by tracking global maximum power point (MPP) of PV array by employing complex MPP tracking (MPPT) algorithm [6], [8]. However, these techniques are not effective for low power SPGCT PV system. Similarly, reconfiguration of the PV modules in a PV array by changing the electrical connection of PV modules [9], [10] is not effective for SPGCT PV system due to the considerable increment in component count and escalation in operating complexity. In order to extract maximum power from each PV module during MEC, attempts have been made to control each PV module in a PV array either by having a power electronic equalizer

A NOVEL NINE LEVEL INVERTER WITH REDUCED POWER DEVICES

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Abstract

In this paper the solar based boost converter integrated Nine level multilevel inverter presented. It uses 7 switches to produce nine level output stepped waveform. The aim of the work to produce 9 level wave form using solar and boost converter. The conventional inverter has multiple sources and has 16 switches are required and also more number of voltage sources required. The proposed inverter required single solar panel and reduced number of switches and integrated boost converter which increase the input voltage of the inverter. The proposed inverter simulated and compared with R load using Mat lab and prototype model experimentally verified .The proposed inverter can be used in n number of solar applications.

Key Words : DC-AC Inverter, Digital Signal Processor, Maximum Power Point Tracking, Multilevel.

I. INTRODUCTION

Multilevel inverters are utilized generally in the regular applications due to the high voltage capacity and it delivers the multilevel with low composition with least concern in the exchanging gadgets. Contrasted with the traditional single scaffold inverter the multilevel inverter lessens the music due to the multi exchanging. The multilevel inverter produces distinctive voltage levels by shifting the exchanging grouping of the inverter. In multilevel inverter as the quantity of voltage levels expanded the sounds delivered in the yield waveform diminishes moderately. The straightforwardness of fell H connect multilevel inverter has a tendency to utilized as a part of numerous applications discussed in
[1].The function and great execution of the anticipated multilevel inverter have been checked by the reenactment aftereffects of a solitary stage nine-level symmetric and 17-level asymmetric multi level inverter and trial consequences of a nine-altitude and 17-stage inverter. Subsequently the recommended structure prompts diminishment of establishment territory and cost and has straightforwardness of control strategy represented in [2].This topology can build the quantity of yield energy stage by utilizing lesser amount of energy electronic gadgets, for example, switch, thyristor family, driver circuit and dc electrical energy sources that prompt decrease in establishment gap and rate of the inverter with various Calculation explained in [3]. Proposed SOP method licenses multilevel inverter to work at a normal gadget changing recurrence constrained to evaluated key recurrence without trading off on consonant twisting are discussed in [4]. This survey considers accomplishing the base aggregate symphonious mutilation (THD) or recurrence biased THD
(WTHD) of the stairway -regulated yield voltage of single-stage multilevel inverters are explained in
[5].This survey deals with the suitable balance plot has likewise been proposed for low exchanging recurrence operation of the proposed topology. In addition, a 15-level inverter with awry source setup has been likewise examined for charge adjust control utilizing the proposed tweak plot is mentioned in [6].Expanding requests for control supplies have added to the number of inhabitants in high recurrence air conditioning (HFAC) control conveyance framework (PDS), and keeping in mind the end goal to build the power limit, multilevel inverters (MLIs) often times filling in as the highrecurrence (HF) source-organize have acquired a conspicuous improvement was discussed in [7].Fell multi level inverter (MLI). Every module is comprised of H-and semi extensions, two detached equivalent dc source and a two directional assistant track. One crutch of the H-connect and the half -connect are hack and the comparing incurable are associated with the two finishes of an equivalent divide dc source are represented in [8].In this survey , it has been outlined the upside of incorporating into the controller plan of a hilter kilter nine-level inverter, when consonant current moderation targets are sought after, a point by point investigation of its non-direct unique conduct. discussed in [9].The commitment can be separated into three sections, specifically, For three-stage lattice associated applications, PV confuses may present uneven provided control, prompting unequal framework current. To illuminate this issue, a control conspire with adjustment pay is additionally proposed. A trial three-stage 7-level fell H-connect inverter has been fabricated using 9 H-connect modules are represented in [9].

INTELLIGENT ENERGY MANAGEMENT SYSTEM FOR DC MICROGRID WITH HYBRID STORAGE SYSTEM

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Abstract— The concept of integration of distributed energy resources for formation of microgrid will be most significant in near future. It shows a broad overview on the worldwide research trend on microgrid which is most significant topic at present. This literature survey reveals that integration of distributed energy resources, operation, control, power quality issues and stability of microgrid system should be explored to implement microgrid successfully in real power scenario. In addition, DC micro grids diverted the attention of researchers and power electronics industry in recent years to stimulate renewable energy technologies (RETs) and distributed energy resources (DERs) deployment and encouraging technological innovation to reduce green house gas (GHG) emission and achieve energy security and independence to meet the growing electricity demand. So for many studies have been done on successful integration of RETs and DERs, operation and control, protection and stability issues, simultaneously and satisfactorily implemented during feasible operation of microgrid. Studies show that DC transmittable power can increase the system efficiency up as compared to AC. But still DC bus voltage fluctuation, power quality and flow during the transition between grid connected mode to islanded mode or transient load insertion which intend to DC microgrid instability are the problems which need to be investigated and resolved for the effective use of DC microgrid generation. In this concept DC microgrid voltage, power flow, power quality and energy management different controls and techniques are reviewed. This concept can be extended as Induction Motor drive Power management for DC Microgrid Application.

Keywords— DC Microgrid, Bus Voltage, Energy Storage System.

I. INTRODUCTION

Nowadays, the issue of vitality emergency has been progressively tense, while low carbon vitality should be created. In this specific situation, dispersed sustainable power source has been given careful consideration and grew incredibly, particularly wind control and photovoltaic (PV) age, because of their inexhaustible accessibility and less effect on the earth. Yet, hypothesis and practice have demonstrated that these disseminated sustainable power source have some intrinsic issues, for example, its irregularity, which has some negative effect on the security, dependability and power nature of utility framework [1]. On this premise, the idea of microgrid exhibited by Robert Lasseter and different researchers is thought to be a double plan to take care of the issue. The microgrid is a nearby vitality organize that incorporates sustainable power sources and capacity frameworks. It can be associated with the mains network or works separated when there is a power outage at the primary matrix, and keeps on providing their nearby loads in "islanded mode" [2-3]. A microgrid can be intended to help substituting current (AC) or direct present (DC). Contrasted and AC shapes, DC microgrid can stay away from the thought of responsive power and recurrence synchronization [4]. In the meantime, some DC sources and DC loads, for example, photovoltaic, supercapacitor, EV and LED, give chances to DC microgrid. Additionally, DC microgrid will have the capacity to expand the general framework proficiency contrasted with AC system.

On the other hand, storage systems are usually installed to alleviate system power mismatch between generation and consumption in DC microgrid, and they can improve the stability, power quality, reliability of supply and overall performance of microgrid. Capacity frameworks can be described in view of energy thickness, vitality thickness, incline rate, life cycle et cetera, however none of the capacity frameworks satisfy every normal component. The normal vitality stockpiling in reasonable building is lead corrosive batteries, which have high vitality thickness however low power thickness, low charge/release rates and life expectancy of under 1000 full cycle. So batteries can't react quickly under regular load vacillations. Contrasted with battery, super-capacitor has high power thickness yet low vitality thickness, high charge/release rates and life expectancy of around 500,000 cycles. Hence, super-capacitor can be utilized to coordinate the snappy load vacillations [5-6]. The mix of the two sorts is essential for differing vitality stockpiling needs of both quick and moderate fluctuating force and it has turned into an exploration hotspot, and the structure of two-sorts stockpiling frameworks have been the subject of more research programs, for example, the mix of batteries and super-capacitors.

ADVANCES ON DISTRIBUTED GENERATION TECHNOLOGY FOR SMART DISTRIBUTION SYSTEM WITH MICROGRIDS

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JETIR

POD and APOD PWM FOR FLYING CAPACITOR MULTILEVEL TOPOLOGY IN SOLAR PV SYSTEM

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Abstract: This paper presents the study of three and five level flying capacitor multilevel inverter with Phase disposition PWM, Phase opposition disposition modulation techniques for PV system. The multicarrier PWM (MCPWM) techniques phase opposition disposition method is employed for the control strategy of three and five level flying capacitor multilevel inverter. In this paper the in-phase disposition PWM controlling strategy is used for controlling the three and five flying capacitor multilevel inverter. Simulation has been carried out using MATLAB (2017) and the output voltage waveforms are recorded. The Total Harmonic Distortion (THD) is found to be less for the multilevel inverter compared to the cascaded H-bridge multilevel inverter

Keywords: *PWM Inverter, Flying Capacitor, Multilevel Inverter, Phase Opposition Disposition (POD) & Alternate Phase Opposition Disposition (APOD).*

1. Introduction

The area of power electronics is revolutionized using by the advent of multilevel inverters and rapid growth of this new area in recent past. This technology finds use in many applications including industries. The technology of multilevel inverters is an ever-expanding technology which progresses manifold and day by day, new variants and versions of multilevel inverter technologies are spotted many times in recent literature. This paper mainly focuses on review and in-depth view of this rapid ever-growing power electronic technology. The paper first describes the penetration of the multi level inverters in the various types and scales of industries and other auxiliary applications. Later, the advanced and updated power electronic circuit topologies are presented. There happens to be numerous advantages of multilevel inverters in the field of power electronics. Improvement of percentage reduction of harmonics, reduced effect of problem of electromagnetic interference (EMI), enhanced rating of the inverter topology are preliminary advantages of multilevel inverters in addition to the increase of levels of dc and improvement in the waveform of the output voltage. Modular photovoltaic system, vehicular technology based on electricity, drives used in industries for middle level voltage applications are the primary users of the multilevel power electronic technology. The present focus of the paper lies in the design of multilevel power electronic topology for middle level and high-level industries and other related applications. The background of paper idea is clearly discussed and the objectives along proof of motivational aspects are also presented in detail.

2. Medium and High-Power Inverters

The design of inverter the involves various topologies of power electronic technology-based converter and associated control strategies with them. There are various aspects of the converter topology and the variation in the topology is observed based on the usage and applications of the converter. The approaches to the design aspects are varied based on the specification of the converter application and usage. The main philosophy lies in the superior quality of power delivered out from the inverter. The non-ideal output voltage waveform is filtered using various filtering appliances like capacitive elements, inductive elements [1-2].

If the multilevel converter technology involves the concept of transformer then care should be taken to implement filtering scheme on primary as well as secondary side.

Low-pass channels are connected to permit the key part of the waveform to go to the yield while constraining the entry of the consonant segments. Subsequently nature of waveform can be balanced. Note that, typical inverters dependably create low quality yield waveforms. To make the yield waveform subjective, low pass (LC channel) are frequently included the circuit. Be that as it may, at first, we attempt to make sense of the converter applications from low energy to high power and after that we abridge the prerequisites to take care of the power demand. At long last we attempt to display the issues and arrangements accessible to take care of the power demand.

The table 1 summarizes the range of power and type of power electronic equipment to be used based on various applications. The table shows that this latest power electronic based mutli inverter technology is found be promising and has

POWER FLOW CONTROL AND POWER MANAGEMENT WITH BACK-BACK CONVERTERS IN A UTILITY CONNECTED MICROGRID SYSTEM

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Abstract— This paper proposes a method for power flow control between utility and microgrid through back-to-back converters, which facilitates desired real and reactive power flow between utility and microgrid. In the proposed control strategy, the system can run in two different modes depending on the power requirement in the microgrid. In mode-1, specified amount of real and reactive power are shared between the utility and the microgrid through the back-to-back converters. Mode-2 is invoked when the power that can be supplied by the distributed generators (DGs) in the microgrid reaches its maximum limit. In such a case, the rest of the power demand of the microgrid has to be supplied by the utility. An arrangement between DGs in the microgrid is proposed to achieve load sharing in both grid connected and islanded modes. The back-to-back converters also provide total frequency isolation between the utility and the microgrid. The impact of dc side voltage fluctuation of the DGs and DG tripping on power sharing is also investigated. The model of the microgrid power system is simulated in MATLAB.

Keywords—microgrid, back-to-back, inter-link converter, voltage control mode, PQ control mode

I. INTRODUCTION

The interconnection of distributed generators (DGs) or embedded generators operating at remote end to the utility framework through power electronic converters has raised worry about legitimate load sharing between various DGs and the network. Microgrid can for the most part be seen as a bunch of appropriated generators associated with the primary utility matrix, as a rule through voltage-source-converter (VSC) based interfaces. Concerning the interfacing of a microgrid to the utility framework, it is essential to accomplish an appropriate load sharing by the DGs. A heap offering to negligible correspondence is the best in the circulation level as the system is intricate, can be reconfigured and traverse over an expansive territory. The most widely recognized strategy is the utilization of hang attributes. Parallel converters have been controlled to convey wanted genuine and receptive energy to the framework. The utilization of neighborhood motions as criticism to control the converters is alluring, since in a genuine framework, the separation between the converters may make a between correspondence unreasonable. In view of this, this paper proposes a design that is appropriate for providing electrical energy of high caliber to the microgrid, particularly when it is being provided through controlled converters. The genuine and receptive power sharing can be accomplished by controlling two autonomous amounts—the recurrence and the crucial voltage greatness [1-5]. The framework dependability amid stack sharing has been investigated in [2] and [3].

Transient dependability of energy framework with high infiltration level of energy gadgets interfaced (converter associated) disseminated age is investigated in [5-12]. In [11], the coordination of the rate of progress of recurrence (ROCOF) and under/finished recurrence transfers for disseminated age insurance considering islanding discovery and recurrence stumbling prerequisites is explained. The strategy depends on the idea of utilization district, which characterizes an area in the trigger time versus dynamic power awkwardness space where recurrence based transfers can be acclimated to fulfill the counter islanding and recurrence stumbling necessities all the while. When all is said in done, a microgrid is interfaced to the primary power framework by a quick semiconductor switch called the static switch (SS). It is fundamental to ensure a microgrid in both the matrix associated and the islanded methods of operation against all flaws. Inverter blame streams are constrained by the evaluations of the silicon gadgets to around 2 for every unit appraised current. Blame streams in islanded inverter based microgrids might not have sufficient extents to utilize customary overcurrent insurance procedures [12]. To conquer this issue, a dependable and quick blame discovery strategy is proposed in [13]. The point of this paper is to set up a power gadgets interfaced microgrid containing appropriated generators. A plan for controlling parallel associated DGs for legitimate load sharing is proposed. The microgrid is associated with the utility with back-toback converters. Bidirectional power stream control between the utility and microgrid is accomplished by controlling both the converters. The consecutive converters give the truly necessary recurrence and power quality separation between the utility and the microgrid. An appropriate hand-off breaker co-appointment is proposed for

PERFORMANCE ANALYSIS OF FUZZY BASED IUPAC TO PROVIDE GRID VOLTAGE REGULATION AT CRITICAL LOAD BUS

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Abstract: This paper presents a new connection for a UPQC called interline UPQC (IUPQC). The improved controller of IUPQC includes all functionalities of those previous ones, including the voltage regulation at the load-side bus, and now providing voltage regulation at the grid-side bus, like a STATCOM to the grid. The performance of the IUPQC and the UPQC was compared when working as UPQCs. The main difference between these compensators is the sort of source emulated by the series and shunt power converters. The structure, controland capability of the IUPQC are discussed in this paper with the fuzzy logic controller. The efficiencyof the proposed configuration has been verified through simulationstudies using MATLAB/Simulink.

Keywords:iUPQC, micro grids, power quality, static STATCOM, Fuzzy Logic

Introduction:

Electric power quality may be defined as a measure of how well electric power service can be utilized by customers. Power Quality problem is an occurrence manifested as a nonstandard voltage, current or frequency that results in a failure or a misoperation of end user equipment. To compensate harmonics conventional Passive Filters are used for specific number of harmonics. To compress total harmonic content Active Power Filters are used. For all types of power quality solutions at the distribution system voltage levelDFACTS also called as Custom Power Devices are introduced to improve Power Quality.

In contrast, power-electronics-driven loads generally require ideal sinusoidal supply voltage in order to function properly, whereas they are the most responsible ones for abnormal harmonic currents level in the distribution system. In this scenario, devices that can mitigate these drawbacks have been developed over the years. Some of the solutions involve a flexible compensator, known as the unified power quality conditioner (UPQC).

The STATCOM has been used widely in transmission networks to regulate the voltage by means of dynamic reactive power compensation. Nowadays, the STATCOM is largely used for voltage regulation [9], whereas the UPQC and the iUPQC have been selected as solution for more specific applications. Moreover, these last ones are used only in particular cases, where their relatively high costs are justified by the power quality improvement it can provide, which would be unfeasible by using conventional solutions. By joining the extra functionality like a STATCOM in the iUPQC device, a wider scenario of applications can be reached, particularly in case of distributed generation in smart grids and as the coupling device in grid-tied microgrids.

Custom Power Devices:

A Custom power device provides "wide area" power quality protection: that is to say, a single device can protect all of a plant's critical loads, rather than protecting a single load like a UPS product. The Custom Power products are appropriate for large energy sensitive to the quality of electricity supply. Custom Power is a technology driven product and service solution, which embraces a family of devices, which will provide power quality functions at distribution voltages. It has been made possible by the now widespread availability of cost effective high power solid-state switches such as GTO's and IGBT's. The rapid response

CONTROL SCHEME BASED ON Z-SOURCE FOR FOUR SWITCH THREE PHASE BRUSHLESS DC MOTOR

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Abstract:
This paper proposes novel four-switch three phase brushless dc motor control scheme based on quasi Z-source network which improves the utility ratio of DC voltage, increases the range of speed and minimizes the output torque ripple. The additionally partial circuits of quasi Z-source network and the bridge arm of four-switch inverter involves the quasi Z-source converter. During the operation of motor, shoot through states are applied. Then the input voltage of inverter extends and the performance of motor can be markedly improved. The dynamic performance of current is influenced and the speed is limited, for the irregular dc-link voltage utilization in the control of four-switch three phase Brushless DC motor. This paper presents a novel topology, which merges quasi Z-source converter and four-switch three phase drive circuit. The drawbacks of four-switch three-phase Brush less DC motor are analyzed; the control methods of each mode in quasi Z-source four-switch three phase topology are illustrated. Simulations for quasi Z-source four-switch three-phase Brushless DC motor were constructed in MATLAB/Simulink circumstance. To reduce the ripple in torque and distortion in current the quasi Z-source four-switch three-phase Brushless DC motor control scheme is proposed.

KEYWORDS: *Z-Source Network, BLDC Motor, DC link Voltage, Back EMF*

Introduction:

Brushless dc motor is mostly applied in various fields, because of its high power density, large output torque and quickly dynamic response, etc. Four-switch three-phase brushless dc motor is developed based on the driving circuit that is composed of conventional six-switch inverter. It has the merits of low-driven cost and less switching loss. Therefore, it is of great significance to research on performance enhancements of four-switch three-phase brushless dc motor.

According to the deficiency of FSTP brushless dc motor, many scholars at home or abroad put forward a series of improved strategy. In full dc-link voltage period, the distortion of phase current will happen for existence of C phase back-EMF. Consequently, the current control based voltage vector is adopted in paper [1-2]. It can make the C phase current converge to zero through inserting adjusting vectors. The method is easy to implement and has merits of fixed frequency, high stability and rapid dynamic response. In paper [3], the double closed-loop control that contains speed and current hysteresis is restrained effectively. To further reduce controlling costs, a novel control scheme of four-switch three-phase brushless dc motor without current sensor is presented in paper [4-5]. The commutation time of motor can be determined through the zero-crossing detection for terminal voltage. Meanwhile, the phase error is significantly decreased for no need of delaying 30 or 90 electrical angles. It combines four-switch three-phase inverter with the boost circuit to increase the input voltage of inverter by three effective- vector current control. Furthermore, it features the compact structure and simple arithmetic. We can provide an alternate strategy to control BLDC motor by using Four Switch Three Phase inverter. FSTPI helps reduction in switching losses, gate

VOLTAGE AND CURRENT CONTROL IN A DISTRIBUTION NETWORK USING OPEN LOOP AND CLOSED LOOP OPERATED STATCOM

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Abstract: Electric power systems are among the best achievements of the last century. Today, vital problems, like AN ever-increasing demand, the versatile and reliable integration of distributed generation or a growth in worrisome masses, should be borne in mind. In this context, sensible grids play a key role, permitting higher potency of power systems. Power physics provides solutions to the same matters, since it permits numerous energy sources to be integrated into sensible grids. Withal, the look of the varied control schemes that are necessary for the proper operation of the power-electronic interface is a important issue that has got to continuously be taken into thought. This paper deals with the look of the system of a distribution static synchronous compensator (DSTATCOM) supported flying-capacitor structure converters. The system is tailored to catch up on each voltage sags by suggests that of reactive-power injection and voltage imbalances caused by unbalanced masses. The look of the general management is carried out by exploitation the root-locus and frequency-response techniques, rising each the transient response and therefore the steady-state error of the control system. Simulation results obtained exploitation PSCADTM/EMTDCTM (Manitoba Hydro International Ltd., Commerce Drive, Winnipeg, MB, Canada) show the resultant voltage regulation.

KEYWORDS: power quality; voltage sag; smart grid; distribution static synchronous compensator (DSTATCOM); flying-capacitor multilevel converter

I. Introduction:

Over the past century, power systems are supported the paradigm of enormous power generation. notwithstanding, this paradigm has become obsolete, because of the depletion of standard fuel provides, like oil and coal, the rise of demand, the provision of competitive distributed energy sources integrated into the grid and environmental problems [1]. Microgrids and good grids are the alternatives that contribute toward achieving the rising potential of distributed generation and to obtain a lot of reliable power systems [2].

Microgrids will operate in Associate in Nursing interconnected mode or in Associate in Nursing islanded mode, and need power-electronic converters, because of the character of most of the distributed energy sources [3]. On the opposite hand, a sensible grid should integrate advanced sensing technologies, management ways and communications into the electricity grid. The good grid is anticipated to exhibit the subsequent key characteristics: self-healing, client friendly, attack resistant, power quality improvement, capability to accommodate all generation and storage choices, best plus for markets and economical operation [1].

The key technologies concerned in good grids embody integrated communications across the grid, advanced management schemes, sensing, metering and measure, advanced grid parts and call support and human interfaces. Among these technologies, the evolution of the advanced grid parts is one among the foremost relevant problems, like succeeding generation of power grid devices, that embody flexible AC gear mechanism (FACTS) devices [4].

Static synchronous compensators (STATCOM) and distribution static synchronous compensators (DSTATCOM) are 2 FACTS devices supported a voltage-source device (VSC), that are wide used to improve voltage regulation and harmonic elimination and to balance the grid current [5,6]; they play a key role among the good grid conception. They'll so contribute toward enhancing power quality and getting a a lot of reliable electricity grid.

Although there are several aspects concerned within the style and operation of STATCOM and DSTACOM devices, this paper focuses on 2 explicit issues: the VSC topology and also the style of the system. For low-tension and low-power applications, STATCOMs and DSTACOMs supported two-level VSCs are ordinarily used. Notwithstanding, because the rating of those devices continues to extend within the realm of reactive-power compensation, the facility electronic converters are starting to be higher-voltage points of the grid. during this approach, construction device topologies are at the moment the foremost standard topologies for high voltage applications: they need been advanced as a way to scale back the voltage stress on the switching devices [7] and to boost on the standard of the wave shape with less filtering necessities. A number of construction device topologies are recommend, though the foremost standard are: neutral-point-clamped converters (NPC), flying-capacitor converters (FC) and H-bridge converters [8]. All of them have edges and disadvantages, and varied pulse-width modulation (PWM) techniques are often used to draw on the simplest management characteristics of those converters [9]. though one among the handicaps of FC converters is that the enlarged range of bulk capacitors with the quantity of levels, that is larger than within the case of government agency configurations, the system to balance the voltages of the capacitors is more versatile within the case of the FC topology, because of the next range of switch mixtures than obtained within the case of government agency

DC DROOP CONTROL STRATEGY FOR DYNAMIC LOAD SHARING IN DC MICROGRID

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Abstract:

In this paper, a nonlinear current-limiting droop controller is proposed to achieve accurate power sharing among parallel operated DC-DC boost converters in a DC microgrid application. In particular, the recently developed robust droop controller is adopted and implemented as a dynamic virtual resistance in series with the inductance of each DC-DC boost converter. The proposed control design takes into account the accurate nonlinear dynamic model of each converter and it is analytically proven that accurate power sharing can be accomplished with an inherent current limitation for each converter independently using input-to-state stability theory. . Extensive simulation results of two paralleled DC-DC boost converters are presented to verify the power sharing and current-limiting properties of the proposed controller under several changes of the load.

Keywords-Microgrid Topology,Dc-Dc converter,Dc load sharing

Introduction

DC/DC converters/regulators form the Backbone of different portable electronic devices like cellular phones, laptops, MP3 players which are using batteries as their power supply. Portable devices usually comprise of several sub-circuits that should be supplied with different voltage levels, which are not the same as battery's voltage level which is the main supply voltage. Microgridis proving to be a promising technologyto achieve reliable and efficient power system withincorporation of distributed generation including renewablesources such as wind, solar, etc. DC microgrids have manyinterconnected sources operating in parallel, supplying powerto the DC bus loads. Solar power plants, battery storagesystems are connected to DC bus via DC-DC converters [1].Just like the frequency droop characteristics of interconnectedsynchronous generators which enable desired load sharing,there is need of a control system embedded in the DC-DCconverters enabling load sharing between them.

The droop control is mostly used in parallel operated converters to achieve power sharing and increase the reliability of the system. In fact, the droop control is a type of distributed control method that can realise the power sharing by the located electrical variables. Its main drawback is represented by the poor voltage regulation. To this end, several improvements for droop methods have been developed in [9], [10], [11], [12], [13], trying to restore the voltage to the rated value. However, another critical issue is that traditional droop control results in inaccurate power sharing

PERFORMANCE ANALYSIS OF SVC AND STATCOM TO ENHANCE POWER SYSTEM STABILITY

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Abstract:
In the same feeder, it will decline the power quality of power supply when the quality is poor at load side which can cause other equipments malfunction even damage devices. Therefore, a reactive power compensation method is suggested to improve the power quality of the electric arc furnace in a distribution power system. Both the static var compensator (SVC) and Statcom can modify power factor and balance three phase currents simultaneously. The statcom can solve the problem of instantaneous state of an SVC. And then, an SVC can reduce power quantity of the active filter. Finally, field measurement data in a metal factory were analyzed. Simulation results confirmed the feasibility of correcting the power factor and balancing load currents simultaneously using the proposed method.

KEYWORDS: Power Quality, Reactive Power, Static Var Compensator, STATCOM, Current.

1.Introduction:

Many metal industries produce steel by using electric arc furnaces (EAFs). It is important to investigate their effects on the power quality [1]-[3]. Generally, there are three periods, boring-down, melting-down, and refining, during the EAF operating process. After preheated with burners, the electrodes are lowered and energized [4]. During boring-down and melting-down periods, the arc current changes dramatically because the scrap is continuously melted and irregularly collapses among the graphite electrodes. Consequently, the status of an EAF randomly varies among short circuit, open circuit, and nonlinear arc model [5].
The major disturbances from an EAF are voltage flicker, load unbalance, and harmonics [l]-[6]. An excessive level of power unbalance and negative sequence current are caused by the failure of arc re-ignition [7]. An unbalanced load could lead to produce undesired negative sequence current in a three-phase three-wire system. This negative sequence current will cause additional losses of generators, transmission lines, and transformers. There are many technologies to adapt the static var compensator (SVC) in three-phase systems that have been illustrated in literatures [8, 9]. The susceptance of each phase of the SVC can be obtained from root mean square (RMS) values of voltage and current of three-phase loads. The compensation algorithm of the SVC can balance the three phase loads and improve the power factor to unity of fundamental component [8, 10].
Unfortunately, the method of symmetrical coordinates is difficult to show any power and current decomposition and their physical concepts [11]. Thus, instantaneous active-reactive power and current in the time domain can not be discussed. One research suggests a compensation algorithm which can balance the three-phase currents by the active power of last cycle and improve the power factor to be close to unity by the instantaneous value of three-phase currents [12]. The instantaneous values of three-phase currents can be transferred to a vector on polar coordinates, which can be decomposed the instantaneous active current and instantaneous reactive current. Though the power factor can be modified by adjusting the instantaneous reactive current, but the three-phase currents can not be balanced in the same time. The reason is that active power has un-symmetry components. This research proposes the active power is a constant which is obtained by using a load forecasting model. Finally, it combines these two

ANN BASED THREE-PHASE FOUR-WIRE SHUNT ACTIVE FILTER CONTROL STRATEGIES FOR RENEWABLE POWER GENERATION SYSTEMS

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Abstract—Now a day's Renewable energy generation system being the emerging new revolution in generating department, but to interface it with the Grid we required high power static PWM converters which are one of the cause for disturbance in power quality in our system. So, In this paper we are proposing a new control technique which is based on artificial neural network theory used in active power filter by using this the renewable sources are not only synchronized with the grid but also improves power quality by compensating the current harmonics and unbalanced current generated by sudden disturbance in load. The topology which is used for active power filter is four-leg voltage source converter. The ANN controller is not only improves the power quality; it also improves the total harmonic distortion in current by suppressing the harmonics. The mathematical modeling of the proposed system is explained in the paper. The active power filter is simulated with two control technique such as PI controller and ANN controller. The simulation results and the tabular form show the superiority of ANN controller over PI controller. The proposed circuit is tested under different operating condition through simulation in MATLAB/ SIMULINK and the results shows the potency of the system

Keywords—Active Power Filter, Four-Leg Converters, PI Controller, ANN Controller, THD, Renewable Generation System.

I. INTRODUCTION

Presently a-days the substantial number of PCs and other touchy electrical burdens associated with the power lattice are straightforwardly influenced by control quality issues [1]. A standout amongst the most critical issues is identified with current music created by the expanding number of non direct loads associated with the power framework, for example, diode and thyristor frontend rectifiers. As an outcome, these music can cause voltage contortions, extra misfortunes in the influence framework, and breakdown of delicate electronic hardware. Hence, symphonious limitation gauges, for example, IEEE 519 [2], have been prescribed to confine the consonant streams infused into the framework by non direct loads. Shunt inactive channels, comprising of tuned LC channels and high pass channels, have been customarily utilized as a straightforward and minimal effort answer forremunerate current sounds. All things considered, their execution unequivocally relies upon the matrix impedance and can cause the undesirable parallel reverberation marvels with the network. In the most recent decades, the expanding unwavering quality of energy semiconductor gadgets has spurred the improvement of energy hardware answers for the issue of consonant flow into the lattice. The shunt dynamic power channel (APF), comprising essentially of a voltage source inverter (VSI) with a substantial capacitor on its dc interface, is viewed as a settled answer for lessen the present sounds to the suggested guidelines limits [3]– [13]. The non-uniform nature of energy age straightforwardly influences voltage direction and makes voltage twisting in control frameworks. This new situation in control appropriation frameworks will require more modern remuneration systems. Albeit dynamic power channels executed with three-stage four-leg voltage-source inverters (4L-VSI) have just been displayed in the specialized writing, the essential commitment of this paper is a prescient control calculation planned and actualized particularly for this application.

Generally, dynamic power channels have been controlled utilizing pre tuned controllers, for example, PI-sort or versatile, for the present and in addition for the DC-voltage circles. PI controllers must be outlined in view of the equal direct model, while prescient controllers utilize the non straight model, which is nearer to genuine working conditions. An exact model got utilizing prescient controllers enhances the execution of the dynamic power channel, particularly amid transient working conditions, since it can rapidly take after the present reference flag while keeping up steady DCvoltage. Up until now, usage of prescient control in control converters have been utilized for the most part in acceptance engine drives. On account of engine drive applications, prescient control speaks to an extremely instinctive control plot that handles multi variable attributes, disentangles the treatment of dead-time pay, and allows beat width modulator substitution. In any case, these sorts of uses show detriments identified with

A NOVEL DC-DC CONVERTER BASED CLOSED LOOP CONTROL OF BLDC MOTOR FOR SPV FED WATER PUMPING SYSTEM

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Abstract— This Paper Presents Novel DC-DC Converter Based Closed Loop Control of BLDC Motor for SPV fed Water Pumping System Solar Photovoltaic (SPV) Array fed Water pumping System Utilizing Buck-boost DC-DC Converter in order to extract the maximum available power from Solar system. Solar energy has the greatest availability compared to other energy sources. For such solar PV systems, maximum power point tracking control is preferred for efficient operation. This concept is dealing with INC method which is one of the MPPT methods. This study deals with a buck–boost converter controlled solar photovoltaic (SPV) array fed water pumping in order to achieve the maximum efficiency of an SPV array and the soft starting of a permanent magnet brushless DC (BLDC) motor. The current sensors normally used for speed control of BLDC motor are completely eliminated. The speed of BLDC motor is controlled through the variable DC-link voltage of a voltage-source inverter (VSI). The VSI is operated by fundamental frequency switching, avoiding the losses due to high-frequency switching, in order to enhance the efficiency of the proposed system.

Keywords*— — *BLDC Motor, Solar PV Array, Buck-Boost Converter, Incremental & Conductance MPPT Method, Voltage source Inverter

1.Introduction

Severe environmental protection rules, shortage of fossil fuels and eternal energy from the sun have impelled the researchers towards the star electrical phenomenon (SPV) array generated power for numerous applications [1]. Water pumping is receiving wide attention today amongst all the applications of SPV array. to reinforce the potency of SPV array and therefore the entire system despite the operative conditions, it becomes essential to control SPV array at its most PowerPoint by suggests that of a most electric outlet following (MPPT)algorithm [2-4]. numerous DC-DC converters are already used to accomplish this action of MPPT.The PV inverters dedicated to the little PV plants should be characterised by an outsized vary for the input voltage so as to just accept completely different configurations of the PV field. This capability is assured by adopting inverters supported a double stage design wherever the primary stage, that sometimes may be a dc/dc convertor, is accustomed adapt the PV array voltage so as to fulfill the necessities of the dc/ac second stage, that is employed to provide Associate in Nursing ac load or to inject the made power into the grid. This configuration is effective additionally in terms of controllability as a result of the primary stage is dedicated to track the utmost power from the PV array, whereas the second stage is employed to provide ac current with low Total Harmonic Distortion (THD). BLDC motors ar most popular over DC motors and induction motors thanks to their benefits like long operative life, higher potency, low maintenance and higher speed torsion characteristics. mechanical device windings of BLDC motors ar energized {in a|during a|in Associate in Nursing exceedingly|in a very} sequence from an electrical converter. A bulkier DC link condenser is connected in between the dc-dc convertor and electrical converter to induce a continuing voltage at the input of electrical converter, therefore to create the voltage ripple free. however the DC link condenser is bulkier in size and its life time is full of operative temperature. furthermore value|thevalue|the price} is regarding 5-15% of overall cost of BLDC motor drive. As a trial to scale back the price of motor, DC link condenser is eliminated at the expense of torsion ripple. therefore a brand new torsion ripple compensation technique is planned to make amends for the torsion ripple related to the elimination of the DC link condenser. during this methodology, torsion ripple compensation technique is planned to a star PV array fed DC link condenser free BLDC motor. The static magnet brushless DC (BLDC) motor is utilized to drive a centrifugal pump coupled to its shaft. The BLDC motor is chosen attributable to its deserves [7,9]useful for the event of appropriate water pumping system. This electronically commutated BLDC motor [9-11] is equipped by a voltage supply electrical converter (VSI) that is operated by fundamental shift leading to low shift losses [12-15]. suitableness of the planned SPV array fed water pumping system subjected to varied operative and settingal conditions is incontestible by satisfactory simulated results victimization MATLAB/Simulink environment. the present literature exploring SPV array-based BLDC motor-driven pump is predicated on a configuration shown in Fig.1. A dc–dc convertor is employed for MPPT of Associate in Nursing SPV array as was common. 2 section currents ar detected in conjunction with Hall signals feedback for management of BLDC motor, leading to Associate in Nursing enhanced price. the extra management theme causes enhanced price and complexness, that is needed to manage the speed of BLDC motor. Moreover, sometimes a voltage-source electrical converter (VSI) is operated with high-frequency PWM pulses, leading to Associate in Nursing enhanced shift loss and therefore the reduced potency. A DC–DC

FUZZY LOGIC BASED THREE PHASE VFD WITH SINGLE PHASE SUPPLY

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Abstract— A 3-Φ VFD is fed from a 1-Φ AC supply. To stop more stresses in the components within the drive and within the input supply, the drive output power should be qualified. To beat this problem, several VFD makers decided that drive to be de-rated. As often as possible, the drive's output frequency is limited, supported the dc voltage ripple hence the DC capacitors aren't emphasized. Although, the traditional technique reduces the stress of the DC capacitor, it doesn't consider the stresses in other parts of the drive, peculiarly the diodes at the input and terminal blocks of input. This paper presents a new method to protect the drive using the Q-axis current with FLC. The motor's q-axis current shows information about the stress of each part of the VFD includes an input diode, an input terminal block and a DC bus capacitor. We recommend limiting the output power by pruning the output frequency based on the average amplitude and ripple of the current of the q-axis rather than the DC-bus voltage ripple. To demonstrate this concept, the traditional DC bus ripple voltage based method is compared to the proposed method using a low-power VFD powered by a single-phase AC power supply.

Keywords :- VFD,DC VOLTAGE RIPPLE,Q-AXIS CURRENT,FLC.

I. INTRODUCTION

In most of the rustic areas, owing to the omission of 3-Φ AC supply, 3-Φ VFDs are implemented to work from a 1-Φ AC power. When using a 1-Φ ac power, the input current flowing into the 3-Φ VFD is three times (or at least double) the current flowing into the 3-Φ VFD when using the 3-Φ Ac supply. There are bound problems that are to be addressed on the victimization of 3-Φ drives with 1-Φ sup-ply. The primary concern is a warming of capacitors owing to higher current ripples and the secondary concern is prodigious the peak values of current of input side diodes. Sadly, for few systems, diodes peak current rating might be lesser the dc current ripple ca-pability of the Dc electrical condenser. For some systems, the drives o/p power is restricted by victimization of solely the DC ripple volt-age based frequency fold-back methodology. Due to this technique, stresses occur in the diode rectifiers. This can scale back the reliability of the diodes. Correspondingly, some needs to be anxious with a continuous current rating of the input side diodes and also the terminal blocks of input. For several systems, diodes are having the capability to maintain the upper values of Root Mean Square current. However, the terminal blocks aren't having the capability to maintain the higher currents on a continuing basis. To beat this concerns, several VFD makers 3 broad ways that of handling 3-Φ VFD's high powered from a 1-Φ Ac supply. They are a) de-rating of VFD's, b) Usage of external hardware [1], c) using of manage-ment algorithm to attenuate the stresses within the VFD [2].

The traditional 1-Φ boost converter technique is shown in figure 1 used to fed a 3-Φ VFD from 1-Φ ac power. A 1-Φ full bridge recti-fier is used for converting ac to dc from that boost inductor is
used for charging and discharging of energy. The main drawback of this technique is, switch T1 carries higher peak current and has higher voltage stress. Ripple across Dc is more than it is hard to remove the second harmonic ripple without pointedly increasing the dc capacitor size.

The operating principle of the front end rectifier system and mode of operation is shown in figure2 [1].a particular time instant, the bidirectional switch is kept for charging and discharging the passive elements. It is a 1-Φ partial boosting device. The main demerit of this topology is the boost electrical device is giant in size. Therefore, bidirectional switch is charged two times for each 50Hz cycle. Hence, the switching frequency is double the supply frequency.

The proposed FLC topology permits the VFD to supply the rated power while not the requirement of derating. Bound management algorithmic rule techniques are used in conjunction with the de-rat-ing possibility.

A STATCOM BASED CONTROL SCHEME FOR GRID CONNECTED WIND ENERGY SYSTEM FOR POWER QUALITY IMPROVEMENT DURING ASYMMETRICAL FAULTS

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Abstract— With growing demand of electrical energy and limited availability of fossil fuels has led to the use of non-conventional sources (like Wind, Solar, Tidal etc.) which are abundant in nature and pollutant free. The brushless generation using Induction generator with excitation capacitor known as self-excited induction generators driven by constant speed prime movers are becoming more popular because of its low cost, ruggedness, low maintenance and no need of DC excitation system since last two decades. Moreover, these generators can also be operate as stand-alone system to provide electricity to isolated rural areas where transmission of power through grid is difficult and uneconomical. However the fundamental problem associated with such generation scheme are poor voltage regulation under varying load. In order to regulate its terminal voltage with varying load the active and reactive power levels at PCC (point of common coupling) have to be maintained constant.

The active and reactive power level are regulated by using modern power electronic converters. But survey shows that existing controllers are either difficult to implement or uneconomical or designed for particular load only. This thesis is intended to develop a STATCOM based voltage controller using PI controller for SEIG feeding both linear and non-linear loads driven by constant speed prime mover.

Index Terms— **Wind Energy Conversion System, STATCOM, Power Quality Improvement.**

I. INTRODUCTION

With increasing demand for electrical power, more emphasis is given on the renewable source of energy for producing electrical power. The depletion of conventional fuels has led to the use of renewable sources of energy like solar, wind, biomass, tidal, etc. Of these, the wind energy is found to be most suitable, clean, abundant and economical form of the non-conventional sources.

Earlier Synchronous generators are used for power generation using wind energy. But their application is limited as they cannot produce electricity at variable speed, require separate DC excitation system and require more maintenance. But now the brushless generation using Induction generator are more commonly used. The induction generator can be used either in grid connected mode or in standalone mode as self-excited induction generators [2]-[10]. The operation of induction generator as standalone system is gaining more attention, as they can provide power to remote areas where it is difficult or uneconomical for power transmission line to supply power. Thus the advantage of using induction generator are low cost, ruggedness, low maintenance, simple operation, good dynamic response and no need of separate DC excitation system.

A HIGH VOLTAGE FUEL CELL WITH LOW COST INVERTER

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Abstract—This paper presents the power control of a polymer electrolyte membrane fuel cell (PEMFC) based grid connected system. Control scheme for inverter control to get the desired active and reactive power output from PEMFC is discussed. A simulation model for PEMFC based Distributed Generation (DG) system has been built in MATLAB/ Simulink using Simpower system block-set. Simulation results show that the real and reactive power from the fuel cell DG system to the grid can be controlled in desired manner.

Keywords—Distributed Generation, Polymer Electrolyte Membrane Fuel Cell (PEMFC), Inverter.

I. INTRODUCTION

Fuel Cells are static energy conversion devices which converts chemical energy of its fuel into electrical energy. Polymer Electrolyte Membrane Fuel Cell (PEMFC) are emerging as an attractive power supply source among several types of fuel cells, for applications such as distributed generation power systems and electrical vehicles because of their high reliability, efficiency and cleanness [1]. Fuel-cell power plants can, therefore, becomes a large part of the generation mix in the future for the reinforcement of grid and improving system integrity. Fuel cell distributed generation (FCDG) systems can be placed at any site normally at the distribution level in a power system, this in turn will allow utilities to meet load growth and postpone transmission and distribution network upgrades [2]–[4]. Proper controllers are needed to be designed for FCDG systems when they are to be connected to a utility grid, so that pre-set amount of real and reactive power may be delivered to the grid or a varying load profile to be supplied [5].

In this paper, power control of grid-connected PEMFC systems is discussed. Simulation models for a PEMFC DG system has been built in MATLAB/Simulink using the Simpower system block-set. Simulation studies are carried out to investigate the real and reactive power controllability of the fuel cell DG systems.

II. FUEL CELL CONSTRUCTION

In 1839, William Grove discovered that by combining Oxygen and hydrogen in a particular configuration, electricity could be generated. Although this discovery was made more than 160 years ago, the basic operating principle discovered still applies. A basic schematic diagram of a fuel cell is shown in Fig. 2. Hydrogen is applied to the anode where a catalyst separates the hydrogen into electrons and positive hydrogen ions. A membrane separating the anode and cathode allows the positive hydrogen ions to permeate through while rejecting the electrons. This forces the electrons to take the provided electrical path, or circuit, to the cathode. Once the electrons reach the cathode, they recombine with the oxygen and hydrogen ions to form water. The following basic reactions demonstrate the process:

When pure hydrogen is used as the fuel, only electricity and water are generated from the fuel cell. This attributes the fuel cell as an environmentally friendly source of energy.

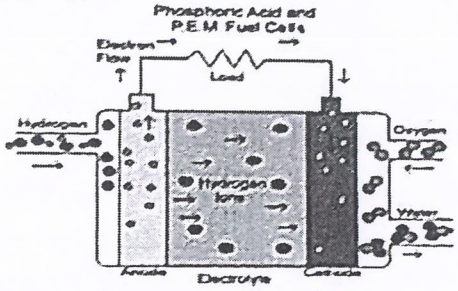

Fig.1. Basic schematic of fuel cell operation

POWER QUALITY IMPROVEMENT BY D-STATCOM WITH PQ THEORY AT DISTRIBUTION LEVEL

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Abstract—The Transient response of the distribution static compensator (DSTATCOM) is very important while compensating rapidly varying unbalanced and nonlinear loads. Any change in the load affects the dc link voltage directly. The sudden removal of load would result in an increase in the dc link voltage above the reference value where as a sudden increase in the load would reduce the dc link voltage below its reference value. The proper operation of DSTATCOM requires variation of the DC link voltage within the prescribed limits. Conventionally, a proportional-integral (PI) controller is used to maintain the dc-link voltage to the reference value. It uses the deviation of the capacitor voltage from its reference value as its input. However, the transient response of the conventional PI dc-link voltage controller is slow. In this paper, a fast acting dc-link voltage controller based on the energy of the dc-link capacitor is proposed and proposed shunt controller method by using PQ-Theory. Mathematical equations are given to compute the gains of the conventional controller based on the fast-acting dc-link controllers to achieve similar fast transient response. The detailed simulation studies are carried out to validate the proposed controller.

Key words—**DC-link voltage controller, distribution static compensator (DSTATCOM), fast transient response, harmonics, load compensation, power factor, power quality, unbalance and voltage-source inverter (VSI) , PQ-Theory.**

I. INTRODUCTION

An increasing demand for high quality, reliable electrical power and increasing number of distorting loads may leads to an increased awareness of power quality both by customers and utilities. This type of power systems has a major function to serve distributed customer loads along a feeder line; therefore under competitive environment of electricity market service of electric energy transfer must not be interrupted and at the same time there must provide reliable, stable and high quality of electric power [2-3]. In order to reduce these problems we have to design carefully the power network planning.

Harmonic currents in distribution system can cause harmonic distortion, low power factor and additional losses as well as heating in the electrical equipment. It also can cause vibration and noise in machines and malfunction of the sensitive equipment. The development of power electronics devices such as Flexible AC Transmission System(FACTS) and customs power devices have introduced and emerging branch of technology providing the power system with versatile new control capabilities [4].There are different ways to enhance power quality problems in transmission and distribution systems. Among these, the D-STATCOM is one of the most effective devices. A new PWM-based control scheme has been implemented to control the electronic valves in the D-STATCOM. The D-STATCOM has additional capability to sustain reactive current at low voltage, and can be developed as a voltage and frequency support by replacing capacitors with batteries as energy storage. [5.6]. From D-STATCOM literature, a majority of research works have been conducted in order to enhance electric power quality due to distribution voltage variations, e.g. voltage sags or swells. Apart from these voltage variations, the D-STATCOM is capable to enhance steady-state performances such as power factor and harmonic of a particular feeder portion. In this paper, a control scheme with constant power and sinusoidal current compensation [1] is exploited. In order to correct the power factor additionally, a power factor control loop is required and therefore included in the control block.

A NOVEL NINE LEVEL MODULAR MULTILEVEL VOLTAGE SOURCE INVERTER

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Abstract— This paper presents a new family of converters for high power interconnection of dc buses with different voltage levels. Proposed converters achieve high voltage dc-dc conversion without an intermediate ac conversion stage. This function is implemented without series connection of active switches, or the use of isolation transformers. The salient features of proposed converters are (i) design and construction simplicity, (ii) low switching losses through soft turn-on and soft turn-off, (iii) single stage dc-dc conversion without high-current chopping, (iv) modular structure, (v) equal voltage sharing among the converter modules.

Three converter circuits are investigated. The first performs unidirectional power transfer from a dc bus with higher voltage to a dc bus with lower voltage. The second performs unidirectional power transfer from a dc bus with lower voltage to a dc bus with higher voltage. Both converters are suitable for interconnecting single pole dc buses with same polarity, or double pole dc buses. A third converter is also presented which performs the function of either the first or the second converter with polarity reversal. The third converter is suitable for interconnecting single pole dc buses with different polarities, or double pole dc buses. By hybrid integration of the proposed three converters, the thesis also investigates other topologies for bidirectional power transfer between two dc buses

Keywords—Low frequency modulation, multi-level inverter, multi-level inverter comparison factor, sinusoidal pulse-width modulation(SPWM),symmetricalDCpowersources,three-phase

I. INTRODUCTION

While high power High Voltage Direct Current (HVDC) transmission is now considered a well-established technology, its application is still dependent on utilizing either Line Commutated Converters (LCC) or Voltage Sourced Converters (VSC). These converters connect dc buses with ac buses and handle power of hundreds of megawatts at voltages of hundreds of kilovolts. Recently, the subject of dc bus interconnections has started to gain increased interest. This interest is driven by the desire to (i) interface power sources that generate dc on a megawatt power range [1], [2], (ii) integrate windfarms through offshore dc networks [3], (iii) build dc distribution networks and dc microgrids [4]-[6], (iv) build dc back-up energy systems [7], (v) build medium-voltage industrial drives, high-speed train power systems and undersea observatories [8],[9] and (vi) provide additional access points to the existing HVDC lines [10]. Two possible alternatives enable the interconnection of dc buses and are shown in Fig.1-1. The first is by using VSC or LCC systems while the second by direct dc-dc conversion. In contrast to VSC and LCC systems, the use of dc-dc converters will directly interconnects dc buses of different voltage levels without use of intermediate ac conversion stage.

Low-voltage and low-power dc-dc converters have long been studied and implemented. High voltage low-power dc-dc converters are less popular but are used in some applications, such as medical X-ray imaging, radio frequency generation, travelling-wave tubes, lasers and high intensity discharge lamps [11], [12]. High-voltage and high-power dc-dc converters are not available as market products yet, but are subject to research efforts [10],[13]-[15],[37].

Classical dc-dc converter topologies have limitations preventing their use for high-power and high-voltage applications. Since power semiconductors have limited voltage ratings, the high-voltage realization of classical topologies would require series connection of active switches (IGBTs in this case). This requires active gate control to ensure equal voltage sharing between all

A NOVEL TECHNIQUE FOR FAST ACTING MPPT FOR INTERLEAVED BOOST CONVERTER IN SOLAR PHOTOVOLTAIC SYSTEM

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Abstract—**In this paper, a MPPT algorithm for soft switching modified Interleaved boost converter for solar PV system is proposed to reduce the switching losses in converter. Conventional DC-DC converters will operate at high frequencies which results in high switching voltage stress, high output voltage ripple and noise. These problems deteriorate the performance of conventional boost converters and lead to low voltage gain. To overcome the above problems, soft switching modified interleaved boost converter with dual coupled Inductors is used. Current ripple at the input side is minimized by parallel connected primary windings of two coupled inductors by sharing the input current. Output voltage ripple and switch voltage stress is minimized by series connected output capacitors. Moreover, secondary of two coupled inductors are connected in series to regenerative capacitor by a diode for boosting the input voltage from PV array and balancing the primary parallel currents through coupled inductors.**

Keywords—PV System, MPPT Algorithm, DC-DC Converter, Soft Switching Interleaved Boost Converter

I. Introduction

Now a day's many industries requires high voltage gain DC-DC converters. For example Fuel-cells and solar photovoltaic system requires high step-up and large input current DC-DC converters to boost the low voltage to high voltage for a grid connected systems. High intensity discharge lamps, (HID), electric vehicles and back-up energy systems requires high voltage gain DC-DC converters to raise a battery voltage of 12v upto 100v at steady operation. [1],[2]. A low battery voltage of 48v needs to convert to 380v in some telecommunications systems and UPS by high step-up converters [3], [4]. Generally, in a boost converter the voltage gain is limited by the parasitic elements of the power devices, Inductor and capacitor. Moreover, a high duty ratio operation may include serious reverse recovery problem of diode rectifier and large ripple current which increases the conduction losses.

Many switching topologies based on the conventional boost converter had been presented for high step-up voltage gain [5]-[9]. In order to handle the high input currents and to reduce the ripple currents, interleaved boost control is introduced in boost converters. Voltage stress of the power devices is equivalent to output voltage in boost converters. Thus high switch voltage stress, diode reverse recovery problem are still major challenges. To solve aforementioned drawbacks, authors proposed a modified interleaved boost converter with dual Inductors and voltage multiplier to satisfy the high step-up applications and low input current ripple.

This paper proposes modified interleaved boost converters with dual Inductor for high step-up and high power applications. This configuration has the advantages of high voltage gain, low output ripple and a low voltage stress across the switches. The proposed converter is able to turn ON the active switches at zero current and minimizes the reverse recovery problem of diodes by reasonable leakage Inductances of the coupled Inductors.

II. System Modeling

A. Mathematical Modeling of PV Array

A photovoltaic system converts solar energy into electricity. The PV technology uses photovoltaic cells which absorbs photons of light and release electron charges. Several PV cells are connected in series and parallel combination constitutes a PV panel or PV module to produce desired output power. The inverter is used to convert the DC power into AC. The energy extracted from the PV system is one of the reliable natural energy sources because of its eco friendly nature. To achieve the maximum efficiency, it is necessary to extract the maximum power from the PV panels.

A QUASI Z-SOURCE INVERTER WITH CONTINUOUS INPUT CURRENT

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Abstract— This paper deals with a new family of high boost voltage inverters that improve upon the conventional trans-Z-source and trans-quasi-Z-source inverters. The improved trans-Z-source inverter provides continuous input current and a higher boost voltage inversion capability. In addition, the improved inverter can suppress resonant current at startup, which might destroy the device. In comparison to the conventional trans-Z-source/-trans-quasi-Z source inverters, for the same transformer turn ratio and input and output voltages, the improved inverter has a higher modulation index with reduced voltage stress on the dc link, lower current stress flow on the transformer windings and diode, and lower input current ripple. In order to produce the same input and output voltage with the same modulation index, the improved inverter uses a lower transformer turn ratio compared to the conventional inverters. Thus, the size and weight of the transformer in the improved inverter can be reduced. This paper presents the operating principles, analysis and simulation results, and compares them with those of the conventional trans-Z-source/-quasi-Z-source inverters.

Keywords - Boost inversion ability, shoot-through state, trans Z-source inverter, transformer, Z-source inverter.

I. INTRODUCTION

The Z-source inverter was proposed in [1] in order to accomplish single-stage power conversion with buck-boost abilities. In the Z-source inverter, both of the power switches in a leg can be turned on at the same time, which eliminates dead time and significantly improves the reliability while reducing the output waveform distortion. Various Z-source inverter topologies have been published in many studies which have been focused on pulse-width modulation (PWM) strategies, modelling and control [2], applications, three level neutral-point-clamped (NPC) topology. Quasi-Zsource inverters were designed to overcome the short comings of the classic Z-source inverter and have advantages such as a reduction in the passive component ratings and an improvement in input profiles. Some papers have recently focused on improving the boost factor of the Z-source inverter by using a very high modulation index in order to achieve an improvement in the output waveform. A combination of the Z-source inverter and switched-inductor structure, called the switched-inductor Z-source inverter, provides strong step-up inversion to overcome the boost limitation of the classical Z-source inverter. In order to overcome inconvenience of inrush current suppression at start up of the switched inductor Z-source inverter, a switched inductor quasi-Z-source is proposed which provides continuous input current, reduced passive component count, reduced voltage stress on the capacitors, lower shoot-through current, and lower current stress on inductors and diodes, in comparison to the switched –inductor Z-source inverter for the same input and output voltages.

In order to improve input current profile, an inductor-capacitor-capacitor-transformer Z-source inverter (LCCT-ZSI) used one more inductor and one more capacitor in comparison with the trans-Z-source/quasi-Z-source inverters. All topologies suit for solar and fuel cell applications, since they require high voltage gain in order to match the source voltage to the line voltage.

This paper presents a novel of high step-up inverter based on the transformer to improve the input current profile and the boost inversion ability of the conventional trans-Z-source inverter/-quasi-Z-source inverter. Like the traditional Zsource inverters, the improved inverter turns on both power switches in a leg to boost the dc bus voltage. The current drawn from the DC source is continuous. In addition, the improved inverter can suppress resonant current at start up, which might destroy the devices. Both shoot-through states and transformer turn ratio can be regulated to control the boost voltage gain. Thus the output voltage can be adjusted over a wide range, and can be boosted to a higher value.

PERFORMANCE EVALUATION OF FUZZY CONTROLLER BASED DISTRIBUTED GENERATORS WITH HYBRID INVERTER FOR UNBALANCED LOADS

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Abstract— The three-stage four-leg voltage source inverter (VSI) topology is an intriguing alternative for the three stage four wire framework. With an extra leg, this topology can accomplish predominant execution under the uneven and additionally nonlinear load condition. Be that as it may, because of the low transfer speed of the traditional controllers in high power inverter application, the framework can't ensure the adjusted yield voltage under lopsided load condition. The greater part of the techniques proposed to tackle this issue so far principally utilize the various synchronous casings strategy. Notwithstanding, it requires a great deal of calculation because of the edge change and a few quantities of controllers. This paper proposes a basic half and half controller which consolidates a PI controller and a thunderous controller in the synchronous casing synchronized with positive grouping segment of yield voltage of the three stage four leg inverter. The outline system for the controller plan and the hypothetical investigation are introduced. The execution of the proposed idea can be actualized to Fuzzy Logic Controller and contrasted and that of the customary PI controller.

Keywords-Distributed generation,3-leg inverter,4-leg inverter, unbalanced load.

I. INTRODUCTION

As of late, eco-accommodating distributed generation frameworks (DGS, for example, wind turbines, sun oriented cells, and energy components are significantly developing since they can satisfy the expanding interest of electric power because of the fast development of the economy and strict ecological controls with respect to ozone depleting substance discharges. By and large, the DGSs operate together with the existing framework and supply the demand which is increasing with time and population. Be that as it may, there are a few territories whose integration with the network is unfeasible and after that little scaled independent DGSs are the main proficient alternatives. In such DGSs, contingent upon customers the embedded generation may function together with the network or individually.

Consequently, the voltage controller outline for a solitary DGS unit, which can ensure a decent voltage direction under unequal and nonlinear burdens, is an intriguing subject in the field of the DGSs control. To improve the nature of inverter yield voltage, numerous specialists are taking a shot at planning the controllers for de– air conditioning power converters. In a vigorous controller is produced for adjusted and uneven frameworks, which thinks about the vulnerabilities of the heap parameters. Be that as it may, nonlinear load isn't completely tended to. In a dull control is utilized to direct the UPS inverters. In any case, the moderate reaction and absence of the methodical strategy to balance out the mistake elements with the dreary control are being the principle issues. In an option control procedure with an encourage forward remuneration part can essentially relieve the impact of load unsettling influence and influence the controller to plan straightforward. In any case, the utilization of this strategy is chiefly restricted to adjusted load conditions. In a present control procedure in view of the spatial monotonous control is connected to a solitary stage inverter and it additionally enhances the execution of the present controller by assessing the unsettling influences. In spite of the fact that this control can get great outcomes under nonlinear load, it may not ensure a decent voltage following limit with respect to a three stage framework. In a hearty servomechanism voltage controller and a discrete-time sliding mode current controller are displayed to control a solitary dispersed age unit in an independent mode which can work well under a sudden load change, a varying load, and a nonlinear load.

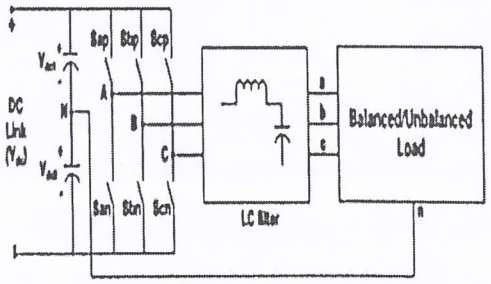

Fig.1: 3-leg inverter

SEF-DFIG BASED HYBRID GRID CONNECTED SYSTEM

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Abstract: Generally, Wind energy systems are in need of the hour from electrical energy system point of view. Doubly fed electric machines are best suited for wind systems due to their ability to work under variable speed conditions in new configuration such as single external feeding of DFIG (SEF-DFIG) which has significant merits over the former system. This paper also proposes the concept of hybrid grid energy system which consists of wind as well as other sustainable energy sources such as PV and FC systems. The performance of this hybrid system is observed by simulation case study demonstrate the usefulness of the proposed system.

Key Words: SEF-DFIG, Solar, Wind, Fuel and Grid System

1. INTRODUCTION

In the present scenario, maximum utilization of energy demand in the world is based on fossil fuels such as coal, natural gas and petroleum products. But, in this one of the major disadvantage from these products are global warming, and these result in great danger for life on the planet [1].The alternative solution for this fossil fuels are utilization of sustainable energy sources. The power produced by a wind vitality structure relies upon the atmosphere conditions; for example, if in case of rainy or in case of cloudy conditions, it is not possible to meet the energy demand. The kinetic energy ofthe wind flow can be became other kinds of energy,electrical or mechanical [2]. For flexible and reliable operation of thesystem, the best solution is to integrate the wind generation system with other renewable sources such as solar, electrolyzer, fuel cell or in some cases grid interconnection.

The capability of fuel cell power generation system, wind energy generation system and photovoltaicbased hybrid system can be to overcome the inconvenience caused by the grid power structure. Hence, the coordination of FC, Solar and wind generation system is considered for eliminating the fluctuations [3].

This simulation model is performed using Matlab and SimPower Systems. To verify the effectiveness of the expectedstructure results are shown [4]-[5]. The proposed grid connected hybrid energy system is described in fig 1. It explains the structure for hybrid system based fuel cell, solar and wind energy systems. Mechanical power noted from a wind turbine can be given as [6]:

$$P_m = 0.5\rho A C_p V^3$$

The maximum theoretical power coefficient value is 0.59 in the above formula and that value depends upon two different variables i.e. pitch angled tip speed ratio (TSR) and speed of the rotor to the wind speed is TSR linearly. Pitch angle is nothing but the arrangement of turbine blades at an angle with reference to longitudinal axis.

SOLAR PV SYSTEM WITH BATTERY AS ENERGY STORAGE FOR GRID CONNECTED SYSTEM WITH FIVE LEVEL INVERTER

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Abstract— This Paper aimed at developing a standard procedure for the design of large-scale institutional grid-connected solar PV systems using the roofs of buildings and car parks. Grid-connect PV systems with battery back-up (sometimes referred to as uninterrupted power supply or hybrid solar PV systems) are becoming increasingly popular. Grid-connected systems do not need batteries which reduces considerably initial capital costs and energy costs. For a comparable load, grid -tied systems use smaller PV arrays than stand-alone systems. In order to address this issue, a two-stage stand-alone scheme consisting of a novel transformer coupled dual-input converter (TCDIC) followed by a conventional full-bridge inverter is proposed. The proposed TCDIC can realize maximum power point tracking and battery charge control while maintaining the proper voltage level at the load terminal. A suitable control strategy for the proposed TCDIC devised for manipulating the TCDIC to realize the first two aforementioned objectives, while the third objective is achieved by employing a conventional proportional integral (PI) controller to control the output voltage of the five level inverter through sinusoidal pulse width modulation.

Keywords— dual-input dc–dc converter, solar photovoltaic (PV) converter, grid Connected system, Battery charge control, PV-based stand-alone scheme

INTRODUCTION

These days interest for control all through the world increments and these requests can't meet by traditional sources (like warm and hydro age) in view of restricted accessibility of coal and water. Henceforth whole world foot forward to the sustainable power sources like breeze and sunlight based vitality they never going to be vanish, and these are the most encouraging other options to supplant customary vitality sources [1], [2]. Be that as it may, successful use of inexhaustible sources and for getting greatest power yield requires quick acting force electronic converters [3]. For three-stage applications, two sorts of energy electronic setups are normally used to exchange control from the sustainable power source asset to the network: 1) single-stage and 2) twofold phase change. In the twofold phase change for a PV framework, the primary stage is generally a dc/dc converter and the second stage is a dc/air conditioning inverter. In first stage the DC-DC converter gives most extreme power following from PV module and furthermore delivers fitting DC voltage for organize 2 reversal. In stage2 (reversal arrange) inverter produces 3-ϕsinusoidal voltages or streams and it exchanges energy to stack associated or to the framework [4].The framework structure is extremely adaptable. PV modules are the principle building obstructs; these can be orchestrated into clusters to expand electric vitality generation. Ordinarily extra hardware is essential with a specific end goal to change vitality into a helpful shape or store vitality for sometime later. The subsequent framework will in this manner be dictated by the vitality needs (or loads) in a specific application. PV frameworks can be extensively characterized in two noteworthy gatherings [12].

1) **Stand-Alone:** These frameworks are disengaged from the electric conveyance matrix. Figure.1 portrays the most widely recognized framework setup. The framework portrayed in Figure.1 is really a standout amongst the most perplexing; and incorporates every one of the components important to serve AC apparatuses in a typical family or business application.

A NOVEL CONTROL STRATEGIES FOR POWER QUALITY IMPROVEMENT WITH MULTILEVEL INVERTER BASED IPQC FOR MICROGRID

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Abstract:

A micro grid is a hybrid power system consists of several distributed resources and local loads .Now a days with increasing on a day to day life micro grid plays a vital role in power generation using Renewable Energy Sources. Usage of power electronic devices in a micro grid results in harmonic generation and leads to various power quality issues.Inorder to overcome voltage fluctuations and over current a magnetic flux control based variable reactor is proposed.The performance of IPQC can be verified by using MATLAB/SIMULINK.

Keywords: Micro Grid, Overcurrent, Power Flow, Power Quality, Transformer, Variable Reactor, Multilevel Inverter

1.INTRODUCTION

The strength is neither be created nor destroyed alternatively it are frequently regenerate from one sort to a different. The technology of AN energy is nothing then again the conversion of various one-of-a-kind sorts of energy into AN power. The electric powered energy is generated in bulk at the producing stations that are referred to as strength stations. The generated strength is demanded by means of the customers. This purpose due to the fact of electricity losses and strength quality troubles inside the transmission lines FACTS machine is added to cut lower back such issues. Small grid ends up in positive distribution in geographic vicinity all distribution consists of tremendous electricity processor to control and display the facility trade between the grids [1-3]. once such processor get definitely exploited it ends up in high electricity great problems and strength consumption with the aid of creating slender band verbal exchange and native administration system full small grid is exploited with marginal investment. A forty eight pulse structure electrical converter used to be developed by way of cascading many devices of 3 degree diode clamped shape electrical converter with the help of section moving electrical device. It ends up in high fee and prolonged delays this motive serious deficiency in power transmission capability whereas distribution [4]. Interline Power Flow Controller is one in each of the advanced controller in versatile AC equipment mechanism controller it completely compensates collection and manages strength waft inside the machine [5].

COMPARATIVE STUDY Of DFIG AND SQUIRREL CAGE INDUCTION GENERATOR (SCIG) USED IN WIND FARM AND REACTIVE POWER COMPENSATION

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Abstract—Wind Farms (WF) employing squirrel cage induction generator (SCIG) directly connected to the grid, represent a large percentage of the wind energy conversion systems around the world. In facilities with moderated power generation, the WF are connected through medium voltage (MV) distribution headlines. A situation commonly found in such scheme is that the power generated is comparable to the transport capacity of the grid. This case is known as Wind Farm to Weak Grid Connection, and its main problem is the poor voltage regulation at the point of common coupling (PCC). Thus, the combination of weak grids, Wind power fluctuation and system load changes produce disturbances in the PCC voltage, worsening the Power Quality and WF stability. This situation can be improved using control methods at generator level, or compensation techniques at PCC. In case of wind farms based on SCIG directly connected to the grid, is necessary to employ the last alternative. Custom power devices technology (CUPS) result very useful for this kind of application. In this paper is proposed a compensation strategy based on a particular CUPS device, the Unified Power Quality Compensator (UPQC). A customized internal fuzzy logic control scheme of the UPQC device was developed to regulate the voltage in the WF terminals, and to mitigate voltage fluctuations at grid side. The internal control strategy is based on the management of active and reactive power in the series and shunt converters of the UPQC, and the exchange of power between converters through UPQC DC–Link. This approach increase the compensation capability of the UPQC with respect to other custom strategies that use reactive power only. Simulations results show the effectiveness of the proposed compensation strategy for the enhancement of Power Quality and Wind Farm stability.

This guide is useful to anyone who would like to contribute to open source projects on MATLAB. Open Source is a Great Platform for MATLAB Enthusiasts to share idea. Thank you for your willingness to contribute.

Keywords—Active power, Reactive power, voltage fluctuations, Squirrel Cage Induction Generator, Wind Farm.

I. INTRODUCTION

With the increase in population and industrialization, the energy demand has increased significantly. However, the conventional energy sources such as coal, oil, and gas are limited in nature. Now, there is a need for renewable energy sources for the future energy demand [1].The other main advantages of this renewable source are eco-friendliness and unlimited in nature [2]. Due to technical advancements, the cost of the wind power produced is comparable to that of conventional power plants. Therefore, the wind energy is the most preferred out of all renewable energy sources [3]. In the initial days, wind turbines have been used as fixed speed wind turbines with squirrel cage induction generator and capacitor banks. Most of the wind turbines are fixed speed because of their simplicity and low cost [4]. By observing wind turbine characteristics, one can clearly identify that for extracting maximum power, the machine should run at varying rotor speeds at different wind speeds. Using modern power electronic converters, the machine is able to run at adjust able speeds [5]. Therefore, these variable speed wind turbines are able to improve the wind energy production [6]. Out of all variable speed wind turbines, doubly fed induction generators (DFIGs) are preferred because of their low cost [7]. The other advantages of this DFIG are the higher energy out put, lower converter rating, and better utilization of generators [8]. These DFIGs also provide good damping performance for the weak grid [9]. Independent control of active and reactive power is achieved by the decoupled vector control algorithm presented in [10] and [11]. This vector control of such system is usually realized in synchronously rotating reference frame oriented in either voltage axis or flux axis. In this work, the control of rotor-side converter (RSC) is implemented in voltage-oriented reference frame.

Grid code requirements for the grid connection and operation of wind farms are discussed in [12]. Response of DFIG-based wind energy conversion system (WECS) to grid disturbance is compared to the fixed speed WECS in [13]. As the wind penetration in the grid becomes significant, the use of variable speed WECS for supplementary jobs such as power smoothening and harmonic mitigation are compulsory in addition to its power generation. This power smoothening is

A COMPARATIVE ANALYSIS OF NOVEL BOOSTING CONVERTER FOR RENEWABLE ENERGY APPLICATION

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Abstract— A hybrid boosting converter(HBC) having collective advantages of regulation competence from its boost structure and enhancement of the gain from its voltage multiplier structure is forthput in this paper. New converter incorporates a bipolar voltage multiplier, prominent symmetrical configuration, single inductor and single switch, high gain capability with wide regulation range, low component stress,small output ripple and obsequious extension, which make it suitable for front-end PV system and some other renewable energy applications. In the proposed work operation principle and voltage ripple are analysed. A 200-W 35V to 415V second order HBC prototype using open loop was designed. In proposed methodnew HBC with PI controller is designed and Induction Motor Drive is connected as the load and verified the performance. The simulation results assure the practicability of the converter

Index Terms- Bipolar voltage multipier (BVM), hybrid boosting converter (HBC), nature interleaving, renewable energy, single switch single inductor.

I. INTRODUCTION

Fossil fuels are depleting day by day, therefore it is imperative to find out alternative methods in order to fulfill the energy demand of the world. Renewable energy is becoming more important nowadays. There exist applications of renewable energy which employ hundred of MW (high power) and there are also those which uses hundred of W (low power). Applications can also be classified depending if they are connected to the grid or not, as well known as cogeneration and stand alone systems. This last one is a low power application, specially employed in remote places, where electricity is not available. Usually photovoltaic and wind systems are the source of energy in stand alone systems. Efficient use of energy is very important, since there is no utility line; a battery set becomes essential because energy power is provided in an irregular way from the renewable source; leaving aside this issue a power conversion stage is required in order to make sure a good output power quality. The operation of a dc/dc converter applicable in stand alone systems is discussed in this chapter, which is for using clean energy as it could be a photovoltaic panel or a wind turbine. The system optimizes delivered energy in a smart way, but assuring its availability in the best possible way. Chapter is organized as follows: stand alone systems are described first, later on some converters reported in literature are discussed, and finally operation, energy administration and results of a dc/dc converter for clean-energy applications are presented.

II. STAND ALONE SYSTEMS AND RENEWABLE SOURCES

Energy is not provided from the utility line for the stand alone systems but from renewable source, which depends on weather conditions. So that, in order to make sure there will exist availability of energy, when load required it, a battery set is traditionally considered. Power consumption is restricted to a maximum limit and it also is a finite measurable quantity, to deliver the more amount of energy its use has to be optimized. A block diagram for stand alone systems is shown in Figure 1. Photovoltaic panel, wind turbine system or both can be used as renewable source of energy; reliable energy is provided by a power converter, which is fed from the renewable source and the battery set, it focus mainly to deliver a regulated voltage to the load.

Certainly weather conditions restrict the renewable sources, but output power not only depends on wind speed or solar irradiance when it is employed a turbine system or a photovoltaic panel, also depend on the load. System behaviour for constant weather conditions is shown in Figure 2; traditionally the output power is plotted against its output voltage, but particularly for this graph the load is been changed, because the system depends on it. For different weather conditions similar graph can be obtained but the power varies according it.

ADAPTIVE DROOP CONTROL IN ENERGRY STORAGE SYSTEM FOR BATTERY PROTECTION MICROGRID

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Abstract

This paper proposes an alternative strategy to control the generated power within an isolated ac microgrid with distributed RES. The proposal is to control the terminal voltage of the existing battery banks below or equal its maximum allowable value. This is done by limiting the amount of power that each energy source can generate at each instant. The microgrid frequency is used to characterize the state of charge of the battery bank and quantify to the converters control systems how much power they need or can generate to maintain under control the internal power balance of the microgrid. The control of the battery banks terminal voltage implies indirectly the control of their SOC.

Keywords:Battery banks, isolated microgrids, parallel inverters, power control, renewable energy sources (RESs), state of charge (SOC).

I. INTRODUCTION

Micro grids are turning into famous of assignment structures because she be able enhance the monitoring quality or reliability on control resources or limit the environmental impact. Micro grid act be able remain classified in twain modes: gridconnected or islanded modes. In general, micro grids are comprised about distributed energy sources (DERs) inclusive of renewable power sources, distributed power tankage systems (ESSs), or partial hundreds [1 3]. However, the usage on renewable energy sources such as breeze then photo voltaic control of micro grids motives monitoring go with the flow versions due in imitation of uncertainties among theirs monitoring outputs. These editions have to remain decreased to forgather power-quality requirements [4,5]. This discipline focuses about coping with the issues as are added by means of air power. To compensate because of fluctuations into breeze power, various ESSs have been implemented between micro grids. Short-term ESSs such as much superconducting magnetic energy storage (SMES) structures [6], electrical double-layer capacitors (EDLCs) [7], then flywheel energy storage systems (FESSs) as like nicely as much long-term ESSs certain as like battery strength tankage systems (BESSs) [8-9] are utilized after micro grid control. ESSs perform additionally remain back after limit the rule glide at factor about frequent merger among the grid-connected passion namely properly namely in accordance with modify the frequency and voltage about a micro grid within the islanded mode. Among this ESSs, BESSs have been implemented extensively due in accordance with their versatility, excessive strength density, and efficiency. Moreover, their charge has decreased inasmuch as their performance or breath has increased. In practice, BESSs along excessive overall performance such as much clean and quickly strong answer throughout charging then discharging are required for Microgrid control. This overall performance depends on the government overall performance concerning the government electronic converter. Proportional-integral (PI) control is a realistic yet popular control method because BESS monitoring systems. However, PI rule may exhibit unsatisfactory consequences because nonlinear or discontinuous systems [10]. When proper applied, these new, allotted technology gadgets (DG) offer great advantage in conformity with the grid then in imitation of cease users. However, merging DGs between the regular grid is no longer barring empirical challenges. The typical electrical grid was now not designed for power generation sources dispensed close to the ends concerning the T&D grid. The successful integration over DG government sources requires the single-direction grid structure about the previous transit after a smarter then greater agile bi-directional grid [11]. As DGs proceed after obtain drawing among the electric market, instant wondering yet recent strategies round power generation, parcelling then bad desire proceed after emerge. One over the an increasing number of frequent techniques because merging DGs into the large electric grid is a new twist over an ancient electrical architecture recognized so the Microgrid. Micro grids are areas about the grid so much do function as like section on the larger macro grid then operate autonomously as like a standalone system.

CASCADED H-BRIDGE NINE LEVEL INVERTER FED SINGLE PHASE INDUCTION MOTOR

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Abstract— This paper presents a new approach for harmonic reduction the usage of multi-level casdaded H-bridge voltage supply single phase inverter. In order to increasing the high-efficiency and low Total Harmonic Distortion (THD), it bought the output voltage waveform to almost sinusoidal waveform. In this approach expected to end result to put off positive harmonics or to minimize a current distortion in the induction motor and it operated system smoothly. In performed, the multi-level casdaded H-bridge voltage source single phase inverter is varying the frequencies at 20 to one hundred hertz for resistance, single-phase induction motor load. Experimental effects are presented to display the suitable performance of the proposed technique.

Keywords— multilevel converters, modelling, power quality, harmonics

I. INTRODUCTION

Multilevel inverters are a class of power switching topologies aimed at high power applications such as motor drives and static power conditioning systems. A conventional full-bridge inverter can apply only two levels of voltage other than zero across their load. In multilevel inverters, an increased number of power switches are configured to provide several levels of voltage to the load. The inverter can then be controlled to synthesise an approximate sinusoid from the voltage levels available. Multilevel inverters have several benefits compared with the standard full-bridge inverter. They allow existing power switches to be used in systems where the dc-link and output voltages are higher than the individual switch ratings, and the individual power device operating frequency can be reduced through the increased voltage synthesis flexibility offered by the extra voltage levels. In motor drives, the voltage stress across the winding is reduced due to the lower voltage steps applied.
There are three main multilevel inverter topologies [1]:

- cascaded-cell
- diode-clamped
- flying-capacitor

The earliest examples of multilevel inverters described in the literature are now known as cascaded cell forms. For example, McMurray's power converter for a sonar transducer [2] patented in the late 1960s. The next inverter form to appear was the neutral-point-clamped (diode-clamped), first patented in the 1970s by Baker [3]. Commercial products using both types are now available, mainly for high voltage, high power, induction motor drives.

II. SINGLE SOURCE MLI

The concept of multilevel inverter control has opened a new avenue that induction motors can be controlled to achieve dynamic performance equally well as that of DC motors. Multilevel inverters produce smaller common mode voltage, therefore, the stress in the bearings of a motor connected to a multilevel motor drive can be reduced. This chapter discusses about the single source multilevel inverter. It has only one DC source and remaining are the capacitors or clamping diodes. One of the multilevel structures that has gained much attention and widely used is the Neutral Point Clamped (NPC) multilevel inverter and is also known as Diode Clamped Multi Level Inverter (DCMLI). DCMLI synthesize the small step of staircase output voltage from several levels of DC capacitor voltages [4]. The other type of single source multilevel inverter is Flying Capacitor Multilevel Inverter (FCMLI). It requires large number of capacitors to clamp the device voltage at one capacitor voltage level.
The DC source is number of cells connected together as battery. The output of battery is given to a multilevel inverter and it converts DC voltage to variable AC voltage employing the PWM technique. The inverter output is quasi sinusoidal stepped output. The performance of the inverter
output is analyzed using a induction motor load as shown in Figure 1

SMC STRATEGY FOR TORQUE RIPPLE MITIGATION IN PERMANENT MAGNET SYNCHRONOUS MOTOR

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Abstract:

This project presents a new extended sliding mode control of permanent magnet synchronous motor with different uncertainities. This Extended sliding mode control can dynamically adjust to the variations of the controlled system and maintaining high tracking performance of the extended sliding mode controller. The extended sliding mode control is proposed to compensate strong disturbances and achieve high servo precision. The sliding mode control is proposed for the rotor speed and stator resistance estimation, under assumptions that only the stator currents and voltages are available for measurement. The results validate the effectiveness of the proposed method through simulation.

Key words —**Disturbance observer, permanent-magnet synchronous motor (PMSM), Sliding-mode control (SMC), sliding-mode reaching law (SMRL).**

I. Introduction:

In the permanent-magnet electric motor (PMSM) system, the classical proportional integral (PI) management technique remains well-liked because of its straightforward implementation [1]. However, during a sensible PMSM system, there ar massive quantities of the disturbances and uncertainties, which can return internally or outwardly, e.g., unmolded dynamics, parameter variation, friction force, and cargo disturbances. it'll be terribly troublesome to limit these disturbances quickly if adopting linear management ways like PI management rule. Therefore, several nonlinear management ways are adopted to boost the management performances in systems with totally different disturbances and uncertainties, e.g., strong management sliding-mode management (SMC) adaptive management back stepping management prognostic management intelligent management and then on. In these nonlinear management ways, SMC technique is acknowledge for its invariant proper-ties to bound internal parameter variations and external disturbances, which may guarantee excellent chase performance de-spite parameters or model uncertainties. it's been with success applied in several fields. within the sliding-mode approach was applied to a six-phase induction machine. during a hybrid terminal slippy-mode observer was projected supported the nonsingular terminal slippy mode and therefore the high-order sliding mode for the rotor position and speed estimation in one PMSM system. within the performance of a sliding-mode controller was studied employing a hybrid controller applied to induction motors via sampled closed representations. The results were terribly conclusive concerning the effectiveness of the sliding-mode approach. A sliding-mode controller applied to induction machine also can be found in [15]. However, the lustiness of SMC will solely be secured by the choice of huge management gains, whereas the massive gains can result in the well-known chattering development, which may excite high-frequency dynamics. Thus, some approaches are projected to beat the chattering, like continuation management, high-order sliding-mode technique, complementary sliding-mode technique [18], and reaching law technique. The reaching law approach deals directly with the reaching method, since chattering is caused by the non-ideal reaching at the top of the reaching part. In [3], authors bestowed some reaching laws, which may restrain chattering by decreasing gain or creating the discontinuous gain a

SOLAR PV SYSTEM BASED PFC HALF BRIDGE CONVERTER FED PMBLDC DRIVE

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Abstract: The PMBLDCM is utilized to drive a mechanical gadget heap of Associate in Nursing cooling through a three-stage VSI encouraged from a controlled DC interface voltage. A buck half-connect DC-DC gadget is utilized as a solitary stage Power issu Correction (PFC) gadget for encouraging a Voltage supply electrical converter (VSI) principally based static magnet Brushless DC Motor(PMBLDCM) drive. The forepart of this ozone depleting substance gadget might be a Diode Bridge Rectifier (DBR) bolstered from single-stage AC mains. The speed of the mechanical gadget is managementled to accomplish vitality protection utilizing an idea of the voltage control at DC connect corresponding to the required speed of the PMBLDCM. so the VSI is worked exclusively as Associate in Nursing electronic commutator of the PMBLDCM. The stator curl flow of the PMBLDCM all through advance change of reference speed is controlled by a rate electrical circuit for the reference voltage at DC interface. The arranged PMBLDCM drive with voltage the executives based ozone harming substance gadget is planned, sculpturesque Associate in Nursingd its execution is reenacted in Mat lab-Simulink surroundings for a forced air system mechanical gadget driven through an one.5 kW, 1500 cycles for each moment PMBLDC engine. The examination consequences of the arranged speed the executives subject square measure presented to exhibit Associate in Nursing enhanced power of the arranged drive framework with ozone depleting substance highlight in wide determination of the speed Associate in Nursingd an info AC voltage.

KEYWORDS: Power Factor Correction (PFC), Voltage Source Inverter (VSI), Permanent Magnet Brushless DC Motor (PMBLDCM), Mat lab- Simulink, Diode Bridge Rectifier (DBR)

I. Introduction:

Permanent magnet brushless DC motors (PMBLDCMs) square measure most popular motors for a mechanical device of Associate in Nursing air-conditioning (Air-Con) system thanks to its options like high potency, wide speed vary and low maintenance needs. The operation of the mechanical device with the speed management ends up in Associate in Nursing improved potency of the system whereas maintaining the temperature within the cool zone at the set reference systematically [1]. the prevailing air conditioners largely have a single-phase induction motor to drive the mechanical device in „on/off" management mode. This ends up in raised losses due to frequent „on/off" operation with raised mechanical and electrical stresses on the motor, thereby poor efficiency and reduced lifetime of the motor.

The PMBLDCM drive, fed from a single-phase AC mains through a diode bridge rectifier (DBR) followed by a DC link condenser, suffers from power quality (PQ) disturbances like poor power issue (PF), raised total

Soft Switching Control of Power Factor Correction for Distribution System

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Abstract: A boost Power Factor Correction (PFC) front end converter followed by a full bridge transformer isolated dc/dc converter is popular in offline dc power supply. In this configuration switching losses are high and overall efficiency is reduced. For solving this problem individual soft-switching techniques are required for both the converters. A dc power supply system that uses a new Zero-Voltage Switching (ZVS) strategy to get ZVS function is proposed here. A soft-switching dc power supply system with high input power factor and stable dc output voltage is presented with simple and compact configuration. The proposed circuit is not only operated at constant frequency, but all semiconductor devices are operated at soft switching without additional voltage stress. A significant reduction in the conduction losses is achieved, since the circulating current for the soft switching flows only through the auxiliary circuit and a minimum number of switching devices are involved in the circulating current path, and the rectifier in the proposed converter uses a single converter instead of the conventional configuration composed of a four diode front-end rectifier followed by a boost converter. An average-current-mode control is employed in proposed dc power supply system to synthesize a suitable low-harmonics sinusoidal waveform for the input current.

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Soft Switching Control of Power Factor Correction for Distribution System

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Abstract: A boost Power Factor Correction (PFC) front end converter followed by a full bridge transformer-isolated dc/dc converter is popular in offline dc power supply. In this configuration switching losses are high and overall efficiency is reduced. For solving this problem individual soft-switching techniques are required for both the converters. A dc power supply system that uses a new Zero-Voltage Switching (ZVS) strategy to get ZVS function is proposed here. A soft-switching dc power supply system with high input power factor and stable dc output voltage is presented with simple and compact configuration. The proposed circuit is not only operated at constant frequency, but all semiconductor devices are operated at soft switching without additional voltage stress. A significant reduction in the conduction losses is achieved, since the circulating current for the soft switching flows only through the auxiliary circuit and a minimum number of switching devices are involved in the circulating current path, and the rectifier in the proposed converter uses a single converter instead of the conventional configuration composed of a four-diode front-end rectifier followed by a boost converter. An average-current-mode control is employed in proposed dc power supply system to synthesize a suitable low-harmonics sinusoidal waveform for the input current.

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Analysis of Plug-In Electric Vehicles Supported Dynamic Voltage Restorer with Battery Energy Storage System (BESS) for Power Quality Improvement

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Abstract: To function properly, all electrical appliances need electricity. Power is the unit of measurement for energy consumption, and it is measured in watts/VA. Any primary distribution system (Bulk consumers) instals the greatest number of loads possible. In this study, one shopping mall was used to test the hypothesis. The overall demand has a significant impact on the electricity tariff per month. Many bulk customers use the maximum demand controller module to avoid paying a penalty on their electricity bill, however during a maximum demand case, non-critical loads will be turned off while critical loads will continue to operate normally. Surges are produced when a non-critical load is turned on and off repeatedly. During peak demand periods, parking-connected Electric Vehicles can provide help for a specific time period.

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A Novel Voltage Unbalance Compensation Control Strategy for DG Interfaced Converters in an Islanded Microgrid

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Abstract: This paper focuses on islanded microgrids where the interfacing converters mainly operate as voltage sources to participate on the voltage and frequency regulation while sharing at the same time active and reactive power accurately by adjusting output voltage phase angles and amplitudes. However, it is also well known that those converters could provide power quality management ability especially for voltage/current unbalances and distortions in a microgrid in such a way that full use of these converters available capacity can be utilized. The negative sequence component of the common bus is hard to suppress, since the microgrid central controller (MGCC) uses the voltage unbalance factor as a main control variable, which value is reduced by the positive sequence voltage. In order to overcome these drawbacks, a control scheme located in the MGCC which directly acts over the negative sequence voltage is proposed in this project work. The proposed control strategy for paralleled three-phase inverters for an islanded microgrid achieves satisfactory voltage unbalance compensation. The effectiveness of the control scheme has been studied with PI and fuzzy based voltage unbalance compensator in an AC microgrid in the MATLAB/Simulink software.

KEYWORDS: Microgrids, voltage unbalance compensation, microgrid central controller (MGCC), point of common coupling (PCC)

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An Enhancement of Power Quality in Grid Coordinated Wind Energy Conversion System Using Fuzzy Controlled UPQC

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Abstract: In renewable wind power connected to the electrical grid is the one of the configuration used in nature. Due to uncertainty in wind speeds. It Injection of the wind power into an electric grid affects the power quality. In this proposed scheme, Unified Power Quality Conditioner (UPQC) is connected at a point of common coupling to mitigate the power quality issues. The battery energy storage is integrated to sustain the real power source under fluctuating wind power. The effectiveness of proposed scheme relives the main supply source from the reactive power demand of the load and the induction generator. The development of the grid co-ordination rule and the scheme for improvement in power quality norms as the grid has been presented. The UPQC control scheme for the grid connected wind energy generation system is simulated using MATLAB/SIMULINK environment.

KEYWORDS: voltage sag, current harmonics, Wind Energy Conversion System (WECS), Unified Power Quality Conditioner(UPQC), Power Quality (PQ).

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PV fed Novel High Step up Soft Switching Interleaved DC-DC Boost Converter with Coupled Inductors

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Abstract: In this paper, a novel high step-up dc-dc converter for distributed generation systems is proposed. The concept is to utilize two capacitors and one coupled inductor. The two capacitors are charged in parallel during the switch-off period and are discharged in series during the switch-on period by the energy stored in the coupled inductor to achieve a high step-up voltage gain. In addition, the leakage-inductor energy of the coupled inductor is recycled with a passive clamp circuit. Thus, the voltage stress on the main switch is reduced. The switch with low resistance RDS (ON) can be adopted to reduce the conduction loss. In addition, the reverse-recovery problem of the diodes is alleviated, and thus, the efficiency can be further improved. The operating principle and steady-state analyses are discussed in detail.

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Fault Analysis in Distributed Generation for Optimal Location & Sizing using Artificial Intelligence Technique

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Abstract: Distributing power generation are small generating units usually installed close to load centres and additionally avoiding the requirement to expand the network so as to hide new load areas or to uphold the raised energy transfers that will be necessary for satisfying the consumer's demand. This study addresses the problem of dg location and size. the thing of the study is to assess the performances of two process strategies for dg the sizing allocation problem, global optimisation, and genetic algorithms yet on study the importance of optimum dg allocation. The study develops IEEE 33bus distribution system using AI technique in MATLAB to spot short circuit faults with distributed generation.

KEYWORDS: Distributing generation, fault analysis, Optimization location and sizing, 33bus system, AI technique

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Power Factor Corrected by Buck-Boost Converter type Battery Charger Employing PWM Technique with Capacitor Bank

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Abstract: In this paper, a buck-boost type battery charger is developed for charging battery set with a lower voltage. This battery charger is configured by a rectifier circuit, an integrated boost/buck power converter and a switched capacitors circuit. A boost power converter and a buck power converter sharing a common power electronic switch are integrated to form the integrated boost/buck power converter. By controlling the common power electronic switch, the battery charger performs a hybrid constant-current/constant-voltage charging method and gets a high input power factor. Accordingly, both the power circuit and the control circuit of the developed battery charger are simplified. The switched capacitors circuit is applied to be the output of the boost converter and the input of the buck converter. The switched capacitors circuit can change its voltage according to the utility voltage so as to reduce the step-up voltage gain of the boost converter when the utility voltage is small. Hence, the power efficiency of a buck-boost type battery charger can be improved. Moreover, the step-down voltage gain of the buck power converter is reduced to increase the controllable range of the duty ratio for the common power electronic switch. A prototype is developed and tested to verify the performance of the proposed battery charger

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Power Flow Control in High Voltage DC Link using ANN and PI Controllers

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Abstract: This paper describes the simulation of HVDC system which is used to transfer bulk amount of power between two converter stations. The main aim of this paper is to reduce the power loss in the HVDC system. In order to reduce these power losses, we go for power flow control. The power flow control can be done by controlling the rectifier and inverter stations with Artificial Neural Network. The HVDC system simulated in this paper is modelled based on the CIGRE HVDC Benchmark system. An error signal e is derived from the difference between the DC current reference Id_{ref} which is taken from the inverter side and the measured DC current Id. This error is fed through an ANN controller to produce an alpha-order signal which is used to control the firing pulses to the converter thyristors.

KEYWORDS:HVDC Transmission, Simulation, Artificial Neural Network, Conventional controller.

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One Cycle Control Approach Based Shunt Filter Active for Current Harmonic Reduction in Three Phase Circuit

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Abstract: Non linear loads generate a harmonic and reactive current, which leads to poor power factor, low energy efficiency, and harmful disturbance to other appliances. Active Power Filters (APFs) are one of the viable solutions to eliminate the power line harmonic/reactive currents generated by nonlinear loads and improve the power factor. A shunt APF is connected in parallel with the nonlinear loads and functions as current sources to cancel the harmonic/reactive components in the line current so that the current flow into and from the grid is sinusoidal and in phase with the grid voltage. Here APF power converter is operated in dual boost converter mode with constant switching frequency by using one cycle control method with Vector operation. Here no need to calculate reference for APF inductor current so that requirement of fast acting microprocessor, complicated digital computation is eliminated. And a fuzzy logic controller is used to regulate the error signal.

KEYWORDS: Nonlinear loads, Active Power Filter (APF), Harmonic current estimation method, Dual -Boost converter, One-Cycle control, fuzzy logic controller.



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Power Quality Improvement using STATCOM and UPQC with PI and Hysteresis Controllers

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Abstract: Any power system consists of wide range of electrical, electronic and power electronic equipment in commercial and industrial applications. The quality of the power is affected by many factors like harmonic contamination due to non-linear loads, such as large thyristor power converters, rectifiers etc. Voltage and current flickering due to the arc furnaces, and sag/swell due to the switching loads also influence the sensitive loads to be fed from the system. Unified Power Quality Conditioner (UPQC) is a custom power device that consists of shunt and series converters connected back to back on the dc side and deals with load current and supply-voltage imperfections. The performance of UPQC mainly depends upon how accurately and quickly reference signals are derived. In the present paper UPQC model is designed which has a dc link for shunt and series compensation. The advantage is that the chance of malfunctioning of two converters is reduced. The control strategy for the two converters is designed in separate ways. Shunt compensation and series compensation of UPQC model are designed using PI and hysteresis controller respectively. Hysteresis current control will be designed to maintain the harmonic level below 5 percent.

KEYWORDS:HVDC Transmission, Simulation, Artificial Neural Network, Conventional controller.

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Design of Shunt Active Power Filter for Harmonic Reduction using VLLMS Method

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Abstract: In this paper, a new control method is presented which enables equal sharing of linear and nonlinear loads in three-phase power converters connected in parallel, without communication between the converters. An active power filter is designed to compensate harmonics using different controllers. The total harmonic distortion is measured at source to check the harmonic level. The APF filter concept uses power electronic switching to generate harmonic components to cancel the harmonic components of the nonlinear loads. It means that in these devices, Direct Current (DC) is converted to form the harmonic currents out of phase of the load which is then injected into AC line, thereby preventing the harmonic currents flowing into the supply. PI and ANN techniques are compared and simulated using matlab simulink software.

KEYWORDS: Shunt Active Power Filter (APF), PI, ANN Controller.

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A Novel Zeta DC-DC Converter Based Closed Loop Control of BLDC Motor for SPV fed Water Pumping System

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Abstract: This paper pesents Novel zeta DC-DC Converter Based Closed Loop Control of BLDC Motor for SPV fed Water Pumping System Solar Photovoltaic (SPV) Array fed Water pumping System Utilizing Buck-boost DC-DC Converter in order to extract the maximum available power from Solar system. Solar energy has the greatest availability compared to other energy sources. For such solar PV systems, maximum power point tracking control is preferred for efficient operation. This concept is dealing with INC method which is one of the MPPT methods. This study deals with a buck–boost converter controlled solar photovoltaic (SPV) array fed water pumping in order to achieve the maximum efficiency of an SPV array and the soft starting of a permanent magnet brushless DC (BLDC) motor. The current sensors normally used for speed control of BLDC motor are completely eliminated. The speed of BLDC motor is controlled through the variable DC-link voltage of a voltage-source inverter (VSI). The VSI is operated by fundamental frequency switching, avoiding the losses due to high-frequency switching, in order to enhance the efficiency of the proposed system.

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Implementation of Novel 31 Level Inverter with Lower DC Voltage Sources for Distribution Network

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Abstract: In this paper, a new general cascaded multilevel inverter using developed H-bridges is proposed. The proposed topology requires a lesser number of dc voltage sources and power switches and consists of lower blocking voltage on switches, which results in decreased complexity and total cost of the inverter. These abilities obtained within comparing the proposed topology with the conventional topologies from aforementioned points of view. Moreover, a new algorithm to determine the magnitude of dc voltage sources is proposed. The performance and functional accuracy of the proposed topology using the new algorithm in generating all voltage levels for a 31-level inverter are confirmed by simulation and experimental results

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Harmonic Reduction on Wind Energy Source with Custom Power Device

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Abstract: This project deals with a neural-network (NN)-based integrated electronic load controller (IELC) for an isolated asynchronous generator (IAG) driven by a constant-power small hydro uncontrolled turbine feeding three-phase four-wire loads. The proposed IELC based distributed facts control utilizes an NN based on the least mean-square algorithm known as adaptive linear element to extract the fundamental component of load currents to control the voltage and the frequency of an IAG with load balancing in an integrated manner. The IELC is realized using zigzag/three single-phase transformers and a six-leg insulated-gate bipolar-transistor-based current controlled voltage-source converter, a chopper switch, and an auxiliary load on its dc bus. The proposed IELC, with the generating system, is modeled and simulated in MATLAB environment using Simulink and Simpower System toolboxes. The simulated results are validated with test results on a developed prototype to demonstrate the effectiveness of IELC for the control of an IAG feeding three-phase four-wire linear/nonlinear balanced/ unbalanced loads with neutral-current compensation. The results are compared with fuzzy based custom power device.

KEYWORDS:Active power filter (APF), ANN, Integrated Electronic Load Controller (IELC), Fuzzy logic controller.

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Hysteresis Current Controlled Power Quality Enhancement of Grid Connected RES using BESS Based DSTATCOM

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Abstract: The advancement of power electronic-based sensitive loads drives the power utilities' devotion to power quality issues. The voltage disturbance could be happening due to fault conditions, switching of loads, energizing of transformers, or integration of highly intermittent energy sources such as PV systems. This research work attempts to enhance the voltage fluctuation of a sensitive load connected to a grid-integrated PV system using a battery-based DSTATCOM. The proposed battery energy storage-based STATCOM has two separate controlling stages that are implemented at the DC–DC buck/boost converter of the battery and voltage source converter (VSC) system. Charging and discharging of the battery is operated based on the state-of-charge (SOC) value of the battery and the measured root mean square (RMS) voltage at the point of common coupling (PCC). The VSI of the STATCOM detection and reference generation control is done appropriately. Simulation results establishes that technique proposed in this manuscript is found to be effective for PQ improvement in hybrid power system during operational events of outage and synchronization of renewable energy (RE) generator.

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Implementation of ANN on Load Frequency Control of Two Area Power System

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Abstract: Interconnected transmission network supplying the national power balance and synchronize the different manufacturing facilities are required to work. Areas that may occur in one of the failures that may occur to any load change and also affect other regions. One of the most important effects of this type of system in the exchange of bus voltage and mains frequency. Electric power transmission systems to provide high quality and constant power load changes caused by oscillation frequency and voltage values must be removed as soon as possible. Fixed frequency is an important factor for power systems quality. Subscribers connected to the energy system at a frequency of changes in energy demand leads to some of the harmonics. Load frequency control system should identify these changes and should not be considered a distortion. With two different regions of a Load Frequency control of power systems using fuzzy logic-based controller are examined. With a load of any change in the frequency of the power system investigated how affected. Then Fuzzy Logic Controller (FLC) changes, such as what is observed in using the system. The system has two different control area power system small signal model in Matlab / Simulink computer simulation program was created. FLC in the control and Integral Controller has been using the system. This produces two different results are compared with the controller. Artificial neural network controller is used in place of fuzzy logic controller for better results.

KEYWORDS:PI controller, Fuzzy Logic Control system, Artificial Neural Networks, dynamic model, Parameter identification, power plant.



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Power Quality Improvement in AC- DC Networks using PWM and Hysteresis Control for Railway Applications

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Abstract: Power quality is a young challenging subject, which was introduced in the early 1980s. The term power quality has been used to describe the variation of the voltage, current and frequency on the power system. Railways consist of AC-DC converters for auxiliary power supply. These converters produce power quality issues. Electric power quality relates to non-standard voltage, current or frequency deviation that results in failure or misoperation of end-user equipment. Power quality issues like harmonics, ripples and transients are more in ac side. In the project we develop a controller to compensate all the current related issues. This project is done using matlab/simulation software. The simulation results will be presented to illustrate the operating principle, feasibility and reliability of this proposed system.

KEYWORDS: Dynamic Voltage Restorer, Active Power Filter, Pulse width modulation, Hysteresis Controller.

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Simulation of Low-Frequency AC Transmission for Offshore Wind Power for Induction Motor Load

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Abstract: This paper presents a low-frequency ac (LFAC) transmission system for offshore wind power. The LFAC system is interfaced with the main power grid with a cyclo converter. The wind power plant collection system is dc based, and connects to the LFAC transmission line with a 12-pulse thyristor converter. A method to design the system's components and controls is set forth. Simulation results are provided to illustrate the system's performance.

KEYWORDS: Wind power, LFAC system, Induction Motor, power grid, cycloconverter, MATLAB/SIMULINK.

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Simulation of Low-Frequency AC Transmission for Offshore Wind Power for Induction Motor Load

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KEYWORDS: Wind power, LFAC system, Induction Motor, power grid, cycloconverter, MATLAB/SIMULINK.

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Voltage Sag Compensation using Dynamic Voltage Restorer with Energy Storage Device

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Abstract: One of the significant worries in power industry today is power quality. It turns out to be particularly significant with the presentation of cutting edge and entangled gadgets, whose exhibition is delicate to the nature of intensity supply. The electronic gadgets are touchy to unsettling influences and in this way mechanical burdens become less tolerant to control quality issues, for example, voltage plunges, voltage hangs, voltage flashes, music and burden unbalance and so on. At present, a wide scope of entirely adaptable controllers, which profit by recently accessible force hardware segments, are developing for custom force applications. Among these, D-STATCOM, dynamic voltage restorer (DVR) and brought together force quality conditioner (UPQC) which depends on the VSC rule are utilized for power quality improvement. The primary point of my paper is to plan DVR which is utilized to remunerate voltage quality issues and Fuzzy Logic Controller is utilized to control the inverter. The outcomes are contrasted and ordinary controller. The outcomes will be examined utilizing matlab/simulink programming.

KEYWORDS: Dynamic Voltage Restorer, Fuzzy Logic Controller, PI Controller, Fuzzy Inference System, Rule View, Surface View.

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Single Phase Eleven Level Grid Connected Inverter for Photovoltaic System

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Abstract: Single-phase grid-connected inverter is usually used for residential or low-power applications of power ranges that are less than 10 kW. Types of single-phase grid-connected inverters have been investigated. The three-level inverter can satisfy specifications through its very high switching, but it could also unfortunately increase switching losses, acoustic noise, and level of interference to other equipment. Improving its output waveform reduces its harmonic content and, hence also the size of the filter used and the level of electromagnetic interference (EMI) generated by the inverter's switching operation. This project proposes a single-phase seven-level inverter for grid-connected photovoltaic systems, with a novel pulse width-modulated (PWM) control scheme. Three reference signals that are identical to each other with an offset that is equivalent to the amplitude of the triangular carrier signal were used to generate the PWM signals. The inverter is capable of producing seven levels of output-voltage levels (V_{dc}, $2V_{dc}/3$, $V_{dc}/3$, 0, $-V_{dc}/3$, $-2V_{dc}/3$, $-V_{dc}$) from the dc supply voltage. Multilevel inverters offer improved output waveforms and lower THD. The behaviour of the proposed multilevel inverter was analyzed in detail by using MATLAB. By controlling the modulation index, the desired number of levels of the inverter's output voltage can be achieved. The 7 level inverter output is compared with design of 11 level inverter.

KEYWORDS:PV System, MPPT, Boost Chopper, 11-level Inverter.

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Modified P&O Algorithm for a PV Solar Tracking System

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Abstract: All life on the earth depends on solar energy. Green plants make food by means of photosynthesis. Light is essential from in this process to take place. This light usually comes from sun. Animal get their food from plants or by eating other animals that feed on plants. Plants and animals also need some heat to stay alive. Thus plants are store houses of solar energy. The solar energy that falls on India in one minute is enough to supply the energy needs of our country for one day. Man has made very little use of this enormous amount of solar energy that reaches the earth. Energy from the sun is called solar energy. The Sun's energy comes from nuclear fusion reaction that takes place deep in the sun. Hydrogen nucleus fuses into helium nucleus. The energy from these reactions flow out from the sun and escape into space. Solar energy is sometimes called radiant energy. These are different kinds of radiant energy emitted by sun. The most important are light infrared rays. Ultra violet rays, and X- Rays. This paper proposes an advanced algorithm for tracking the maximum power point of a solar PV panel. Solar PV cells have a non-linear V-I characteristic with a distinct MPP which depends on environmental factors such as temperature and irradiation. Since the power output varies, based on the irradiation and cell temperature, appropriate algorithms must be utilized to track the (MPP) and maintain the operation of the system in it. Matlab/Simulink is used to establish a model of photovoltaic system with (MPPT) function.

KEYWORDS:Solar cell, PV System, MPPT, P&O.

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An Improved Energy Management for Pv/Battery Hybrid System Using interleaved Boost Converter

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Abstract: This project proposes the integration of photo voltaic array and battery in a micro grid and management of energy happening in the grid. The regulation of battery depending on the requisite of load i.e., battery hold, charge and discharge actions using a bi-directional DC-DC converter has been proposed. The usage of a simple boost converter and interleaved boost converter with MPPT control, two-level inverter and three-level NPC inverter has been compared for various situations like PV delivering supply to the load and charging battery, only PV system delivering supply to the load, only battery delivering supply to the load and PV-battery both delivering supply to the load. Output factors like power, voltage and current are analyzed and plotted for all the situations. The proposed micro grid energy management system is simulated under MATLAB/Simulink environment.

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Impact of Plug-In Electric Vehicles Integrated into Power Distribution System Based Dynamic Voltage Restorer with Energy Storage Integration

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Abstract: This paper proposes the impact of plug-in electric vehicles (PEVs) integrated into a power distribution system based on voltage-dependent control. The gasoline gate situation has many people turning to electric vehicles as a more environmentally friendly option, especially in smart community areas. The advantage of PEVs is modern vehicles that can use several types of fuel cells and batteries as energy sources. The proposed PEVs model was developed as a static load model in power distribution systems under balanced load conditions. Dynamic voltage restorer (DVR) is one product that can provide improved voltage sag and swell compensation with energy storage integration. Ultracapacitors (UCAP) have low-energy density and high-power density ideal characteristics for compensation of voltage sags and voltage swells, which are both events that require high power for short spans of time. The novel contribution of this paper lies in the integration of rechargeable UCAP-based energy storage into the DVR topology. With this integration, the UCAP-DVR system will have active power capability and will be able to independently compensate temporary voltage sags and swells without relying on the grid to compensate for faults on the grid like in the past. The entire system is modeled using MATLAB SIMULINK, the real time controllers are done by Raspberry pi development board and the results prove the feasibility of the proposed idea.

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Series Compensator for Voltage Sag Mitigation using Hysteresis Control

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Abstract: Voltage sag is a major problem in power system that must be solved. To overcome the occurrence of the voltage sag, a system that well known as Dynamic Voltage Restorer (DVR) is needed. In an electrical power system, DVR is positioned in series between a source and load. There are several DVR voltage compensating methods, such as pre-sag method, inphase method and in-phase advance compensation. DVR need synchronization time for equals phase injection voltage so it can compensate voltage sag due to short circuit current. This work employs Discrete Fourier Transform (DFT) for phase detection and hysteresis voltage control. In this project hysteresis technique PI controller is compared with PID controller.

KEYWORDS: Dynamic Voltage Restorer, PI Controller, PID, Hysteresis Controller.

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Hybrid Power Generation System with Inverter using Android based Load Control

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Abstract: In this paper designed a 12V Portable and Compact Hybrid Inverter that will key away from darkness. Solar Panel and Wind Mill is used to generate 12V DC Source. This Voltage is used to Charge 12V / 7 Ah Battery. In this proposed system, designed an Advance Hybrid Inverter System. This System uses two Sources to charge battery. Battery Voltage is further fed to Inverter Circuit, designed using Mosfet and CD4047 IC. This System is also equipped with Android based Load Control System. Android based Load System is designed using Arduino Microcontroller, Bluetooth Module and Relay Module as Major components. User can control Load within the average Range of 20-30 Feet Distance. Variable voltage of DC is taken through 12V Solar Pane and Wind Mill. This Voltage is given to the Charging Circuit using LM317; Output from LM317 is adjusted to 12V and given to 12V/7Ah Battery. Charged Battery Voltage is given to the Inverted Circuit. Inverter circuit consists of a Astable Oscillator (CD4047). This IC Produces a Complementary Square Wave at Pin 10 and 11. Power Mosfets T1 and T2 are connected to output of CD4047 and it serve as drivers for the high-voltage generator, realized using step-up transformer. Here 9-0-9 Step down Transformer is connected in Reverse. Output from Transformer is 230V which is connected to AC Load (Bulb) via a Dual Channel Relay. This Relay Module can be switched On / Off using Bluetooth Based Android Application.

KEYWORDS: Solar panel, Wind Mill, Hybrid System, Arduino Microcontroller.

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Simulation of Interline Unified Power Quality Conditioner (IUPQC) with Artificial Neural Networks

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Abstract: Interline Unified Power Quality Conditioner (IUPQC) is combo of Series and shunt connected second order devices for enhance the power quality (PQ) in distribution system. The role of an IUPQC, which provides both shunt and series compensation, in enhancing the ride through capability is investigated under both full and partial voltage restoration also used for harmonic reduction. This paroject compares total harmonic distortion of IUPQC with Fuzzy Logic (FL), Artificial Neural Networks and Proportional Integral (PI) Controller in PQ enhancement in two feeder utilization system. The proposed IUPQC provides compensation in Voltage disturbances like sag/swell and reduction in Total Harmonic distraction. The efficiency of the proposed configuration has been verified and compared with PI, FL and ANN Controllers configuration through simulation studies using MATLAB/SIMULINK.

KEYWORDS: IUPQC, Harmonics, Fuzzy logic controller, Artificial Neural Networks

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A Control Scheme of a Multilevel Inverter for Integration of Photo Voltaic Generating System with the Utility System

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Abstract: This paper proposes a design and analysis of single-phase five-level and seven-level grid connected inverter for photovoltaic systems, with a novel pulse width- modulated (PWM) control scheme and repetitive sequence method. In seven level grid connected inverter system, three reference signals that are identical to each other with an offset that is equivalent to the amplitude of the triangular carrier signal were used to generate the PWM signals. The inverter is capable of producing seven levels of output- voltage levels (Vdc, 2Vdc/3, Vdc/3, 0, −Vdc, −2Vdc/3, −Vdc/3) from the dc supply voltage.

Keywords: Multilevel inverters, photovoltaic (PV) system, grid connected, pulse width-modulation (PWM), control system, repetitive sequence.

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Grey Wolf Optimization Assisted ANFIS MPPT Algorithm for Single Phase Grid Tied PV System

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ABSTRACT

In this project, a GWO assisted ANFIS MPPT Algorithm for single phase grid tied renewable energy system is proposed. The fossil fuel-based energy generation system has been powering the world for more than two centuries, however, the carbon emissions from these energy systems have severely affected the atmosphere. So, the development of an abundant, sustainable and pollution free energy generation system in the form of PV is becoming popular. The designed DC-DC LUO converter achieves high voltage gain, with low duty cycle and reduced voltage stress, across the power semiconductor switches. The output voltage of the converter is fed to the Grid, through a Voltage Source Inverter (VSI).The outcome of PV is not constant, Adaptive neuro fuzzy inference system (ANFIS) based MPPT is executed to control the DC-DC converter. Then, the MPPT strategy is optimized using Grey wolf optimization (GWO) controller.The output of converter is fed to the grid through a Single-Phase Voltage Source Inverter (1Φ VSI), which converts the DC voltage into AC voltage. The LC filter is employed to enhance the output of the inverter. The switching pulses of the VSI are generated with the aid of dq theory, through which the grid synchronization is achieved with low total harmonic distortion. The entire system is validated through a MATLAB simulation.

KEYWORDS: PV system, GWO, LUO converter,ANFIS MPPT, 1Φ VSI

1.INTRODUCTION

Electric energy is an invisible force that drives the modern world by supporting many aspects of human life. Fossil fuel power stations produce majority of the world's electric power. However the supply of fossil fuel is running out and its extensive use harms the environment through air pollution. So scientists, engineers and power companies in response are trying to enhance and expand the use of alternate sources of electrical energy. Among such sources, solar energy is highly potent with numerous benefits. The PV system that consists of solar modules and power electronic devices, harness the solar energy to generate electrical energy and delivers them to a battery, grid or load. A DC-DC converter is necessary to enhance and maintain the output voltage of PV panel that is generally low [1-3]. The DC-DC converters are divided in to two major group namely non-isolated and isolated DC-DC converters. In this system, a non-isolated DC-DC converter is chosen over an isolated DC-DC converter due to its less complex design. Some of the non-isolated converters available are boost, Cuk, buck boost, SEPIC ,zeta, etc. which step up the DC voltage but fails to afford galvanic isolation and works in extreme duty cycle to obtain high gain [4,5]. In this proposed system, Luo converter has been used to overcome the issues faced by other conventional DC-DC converters.A Luo converter has voltage enhancing features and mostly preferred for applications with high

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Efficient Intelligent Controller For Flyback converter With An Isolated Thirty One Level Inverter For Grid Connected Hybrid System

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ABSTRACT

Rapid exhaustion of fossil fuel energy systems, emission of carbon, and climate change issues has been paid more attention in the recent scenario. The development of power electronic devices, the growth of industries and population increases the need for green energy. The Hybrid renewable energy of wind and PV system are the better choice due to the benefits of the reliability of power based on the weather condition, an extension of the grid system, and remote electrification. In this research, the isolated grid integrated multilevel inverter for hybrid (Solar and wind) battery based fly back converter application is proposed with optimal controlling techniques. The primary objective of this research is to design and develop the fly back converter with an effective controller to obtain the higher power output during the operation of continuous and discontinuous conduction mode respectively. Even though, the researchers are mostly implemented with cascaded H-bridge (CHB) inverter based grid-tied system. CHB are increasing the harmonics, the requirement of the filter circuit and overall efficiency. To solve this issues thirty one inverter is proposed with intelligent techniques as a secondary objective. The modeling and controlling techniques of the discussing system are done by MATLAB tool. The prototype setup provides the experimental feasibility of the developed hybrid PV-wind connected fly back converter with a thirty one level inverter based grid-tied system with reliability of intelligent controller system.

Keywords: Renewable energy, multilevel, flyback, PI, fuzzy, continuous and discontinuous conduction mode

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Power Quality Enhancement in Grid Connected Renewable Energy System using D-STATCOM with ANFIS MPPT

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ABSTRACT

The power quality enhancement has become a major concern among researchers as the use of non-linear loads has grown significantly in the distributed power systems. In this paper, Distribution Static Synchronous Compensator (D-STATCOM) is used to improve the power quality of a distributed power system by mitigating harmonics.Among the various available FACTS devices, D-STATCOM provides better voltage stability with a voltage source.LUO converter is used as it has excellent voltage-gain ratio. The utilization of Adaptive Neuro-Fuzzy Inference System (ANFIS) based MPPT (Maximum Power Point Tracking) assures controlled output and supports the extraction of maximum power from the PV panel. The AC-DC conversion in the DFIG based WECS is accomplished with the help of a PWM rectifier, which is controlled by a PI controller. For the elimination of harmonics, reference current generation is necessary, which is accomplished by Hysteresis Current Controller. The simulation of the entire controlled methodology is carried out by means of MATLAB and it is clearly observed from the result that the proposed approach offers improved power quality with minimal distortion.

Keywords: PV system, LUO converter, DFIG based WECS, ANFIS MPPT, D-STATCOM

1.INTRODUCTION

The word "power quality" is used to indicate the current, voltage, and frequency variations in the power system. As a result of the addition of a significant number of electronic components to the distributed power system, power quality issues have become one of the most crucial problems faced by customers and electric utilities. The non-linear loads like diode bridge rectifier, RL load, variable speed drives, etc. employed in distributed power system create several power quality issues such as voltage swell, voltage sag, harmonics, impulses, transients, etc. The power quality issues if not resolved properly leads to equipment dysfunction which in turn disrupt the entire distributed power system causing severe economic loss [1, 2]. These power quality issues are rectified with the help of different Flexible AC Transmission systems (FACTS) devices like TCSC, SVC, STATCOM, etc.

The Static Var Compensator (SVC) is mainly employed to carry out voltage regulation, flicker minimization, and power factor adjustment. The SVC facilitates voltage regulation and improves power quality by offering switched reactive power on a cycle-by-cycle basis. It is not preferred for industrial power systems owing to the high cost of switching devices [3].The Thyristor Controlled Series Capacitor

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Regulation of Active and Reactive Power using ANN Controller for PV fed Trans Quasi-Z Source Network with Multilevel Grid-Tied System

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ABSTRACT

This paper deals with the design and development of new Z- source inverter and quasi Z-source inverters *topologies and its variants applicable for solar photovoltaic power systems are verified through simulation and experimental validation. The design of proposed topologies of Z-source inverters are based on the comprehensive study of existing Z-source inverters to suit for various applications. While designing impedance network of Z-source inverters, solar photovoltaic modules are treated as the input sources, so modelling, simulation and experimental verification of solar photovoltaic systems are carried out to obtain its performance characteristics. Photovoltaic (PV) modules connected in different array configurations are analyzed under normal/ partial shaded conditions and their performance are obtained in terms of current-voltage and power-voltage characteristic curves, operating at different temperature and insolation conditions through simulation and the same is checked with suitable Matlab software to identify the best possible PV array configuration to be employed in the proposed Z- source inverter topologies under various investigation.*

Key word: PV System, Z Source, Shoot through, Non Shoot through, Seven Level MLI.

1.INTRODUCTION

Renewable Energy System is very significant for improving energy efficiency. It reduces the precocious mortalities due to reduce environmental pollution promoted by fossil fuels and improve public health. RES that consume energy from sun directly and hydro, wind. Environmental changes are slump into the impact of power quality at photovoltaic power systems. As power generation improved, it is used in the consumers and industries. Due to this Multi-level inverters connected at renewable energy sources like wind, solar, battery storage systems [1]. The multi-level method is utilized with lower harmonic distortion to waveform of output reducing-less power output inverter. The power supply for various loads is considered by different renewable energy systems. To be necessary for long transmission lines are eliminated as alternate power generation systems have modular structure which are installed near to load centres. PV generation provides a good solution for micro-grid energy distribution. The PV systems produced maximum power during mid-day time, which overlap with load demand requirements on utility grid [2]. The PV systems are isolated resources because the

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Design and Implementation of Intelligent MPPT with Multiple SEPIC Choppers for PV System

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ABSTRACT

In this project, a Design and implementation of intelligent MPPT with multiple choppers for PV System is performed. The designed multiple SEPIC chopper achieves high voltage gain, with low duty cycle and reduced voltage stress, across the power semiconductor switches. The outcome of PV is not constant, Distributed maximum power point tracking (DMPPT) based MPPT is executed to control the SEPIC chopper. The obtained results indicate that the proposed approach maintains sustainable environment with enhanced efficiency and minimal harmonics. The entire system is validated through a MATLAB simulation.

Keywords: Distributed maximum power point tracking, voltage gain, multiple choppers.

1.INTRODUCTION

In recent years, solar energy has gained great attention and popularity. This condition caused solar energy is considered the best solution for long-distance power applications that demand low voltage DC supplies that utilize alternative energy sources such as chargers for small electronic gadgets, laptops, uninterruptible power supply (UPS) and electric vehicles.

The solar energy sources conversion into electrical energy usually uses PV modules. Until now, PV is considered the best solution for remote area applications. PV has two major weakness, the power generated from PV is highly dependent on weather conditions and the conversion efficiency of PV systems is very low. However, the output characteristics of a non-linear PV module represent a unique operating point where there is maximum power generated in each irradiation. One common method to improve the efficiency of PV systems is develop MPPT controllers that continuously track MPP PV modules on all irradiation and temperature.

Many MPPT methods can be used to obtain optimal PV output power [1] - [6]. This adjusts to the complexity and needs of the system. Direct MPPT search methods such as Perturb and Observe (P&O), Incremental Conductance (INC) and Hill Climbing algorithms can be applied using spontaneous PV voltage (VPV) and PV current (IPV) values to generate control signals. This paper focuses on the P&O algorithm because of its advantages, for example it can be implemented in analog and digital form, does not require periodic, efficient and easy to implement [2]- [3] . The P & O algorithm depend on the slope of the PV characteristic. In this paper, the SEPIC converter is used to validate the proposed P&O MPPT algorithm. Much research has although the boost converter is more efficient than the SEPIC converter, but the SEPIC buck-boost property makes it more adaptable [4]. In this paper we also propose soft switching on SEPIC converters that have

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RESEARCH ARTICLE

Sinusoidal pulse width modulation for a photovoltaic-based single-stage inverter

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Abstract

The work proposed in this paper focuses on providing an effective solution to the shortage of power in rural areas with an effective technique implemented in an economically feasible way. The traditional inverters used for either residential or commercial purposes consume electrical energy from the grid to fulfill the charging and discharging of the battery, which may lead to overloading. The shortcomings of the traditional inverters such as the nonrenewable nature of power sources increased cost of manufacturing, and multistage conversion complexity is considered by the researchers for improvement. As a result, an attempt has been made to provide a cost-effective renewable energy system with a single-stage topology for ac power applications. Single-stage power conversion with an allowed shoot through the state is used here to avoid additional components and reduce the switching losses. Unlike the traditional inverters, the quasi-impedance source inverter (QZSI) that is brought forward can be utilized as a standalone system or a capable backup at the time of power outages. Sinusoidal pulse width modulation (SPWM) is applied to attain reduced harmonics which are measured by observing the harmonic pattern in the total harmonic distortion (THD) curve. The lab results obtained through MATLAB simulation confirm the noteworthy diminution of the THD level in the proposed system compared to the reported one. Usage of photovoltaic (PV) panels to tap energy with reduced stochastic fluctuations due to the high filtering capacity of the proposed circuit, eliminating the need for additional filters, is the uniqueness of this technique.

Keywords Harmonics · Inverter · Single-stage conversion · Photovoltaic · Pulse width modulation (PWM) · Quasi-impedance source inverter (Q-ZSI)

Abbreviations

THD	Total harmonic distortion
PWM	Pulse width modulation
SPWM	Sinusoidal pulse width modulation
SHEPWM	Selective harmonic elimination pulse width modulation
PV	Photovoltaic
ZSI	Impedance source inverter
QZSI	Quasi-impedance source inverter
MPPT	Maximum power point tracking
PQ	Power quality

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Introduction

Solar power is mostly preferred due to its ease of application compared to other forms of green energy. Also, solar power is readily available free of cost. Utilizing PV is the latest trend in research due to green energy. The proposed work is extracted from the research works related to grid-connected PV systems, impedance source inverters (ZSIs), PWM techniques, and QZSIs (Kavya Santhoshi et al. 2019).

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Design and Implementation of Intelligent MPPT with Multiple SEPIC Choppers for PV System

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ABSTRACT

In this project, a Design and implementation of intelligent MPPT with multiple choppers for PV System is performed. The designed multiple SEPIC chopper achieves high voltage gain, with low duty cycle and reduced voltage stress, across the power semiconductor switches. The outcome of PV is not constant, Distributed maximum power point tracking (DMPPT) based MPPT is executed to control the SEPIC chopper. The obtained results indicate that the proposed approach maintains sustainable environment with enhanced efficiency and minimal harmonics. The entire system is validated through a MATLAB simulation.

Keywords: Distributed maximum power point tracking, voltage gain, multiple choppers.

1.INTRODUCTION

In recent years, solar energy has gained great attention and popularity. This condition caused solar energy is considered the best solution for long-distance power applications that demand low voltage DC supplies that utilize alternative energy sources such as chargers for small electronic gadgets, laptops, uninterruptible power supply (UPS) and electric vehicles.

The solar energy sources conversion into electrical energy usually uses PV modules. Until now, PV is considered the best solution for remote area applications. PV has two major weakness, the power generated from PV is highly dependent on weather conditions and the conversion efficiency of PV systems is very low. However, the output characteristics of a non-linear PV module represent a unique operating point where there is maximum power generated in each irradiation. One common method to improve the efficiency of PV systems is develop MPPT controllers that continuously track MPP PV modules on all irradiation and temperature.

Many MPPT methods can be used to obtain optimal PV output power [1] - [6]. This adjusts to the complexity and needs of the system. Direct MPPT search methods such as Perturb and Observe (P&O), Incremental Conductance (INC) and Hill Climbing algorithms can be applied using spontaneous PV voltage (VPV) and PV current (IPV) values to generate control signals. This paper focuses on the P&O algorithm because of its advantages, for example it can be implemented in analog and digital form, does not require periodic, efficient and easy to implement [2]- [3] . The P & O algorithm depend on the slope of the PV characteristic. In this paper, the SEPIC converter is used to validate the proposed P&O MPPT algorithm. Much research has although the boost converter is more efficient than the SEPIC converter, but the SEPIC buck-boost property makes it more adaptable [4]. In this paper we also propose soft switching on SEPIC converters that have

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Performance of DFIG fed wind turbine under fault conditions

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ABSTRACT

This paper discuss the performance of doubly fed induction generator (DFIG) fed wind turbine system under fault conditions. The proposed performance analysis is demonstrated in MATLAB/Simulation software. A sailent pole rotor type induction generator and three phase converter comprises with IGBT switches are employed to propose the DFIG system. The proposed design has ability to extract utmost energy under minimum wind speed constraints. In order to achieve utmost energy, various control designs such as pitch angle control, wind turbine speed, DC bus potential, grid potential and reactive power control are presented in this paper. The simulation results obtained are helps in understanding the dynamic performance of the DFIG fed wind turbine power generation system.

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1. Introduction

Recent improvements in technology and utilities offers in enhanced electrical energy demand in recent years. Also, the climatic changes in environment dictates to choose the pollution free electrical energy generation systems. Renewable energy sources like solar, wind, biomass etc., are playing vital role to meet this enhanced power demand applications. Among the all renewable energy sources, wind turbine power generation systems are clean and green energy system which offers fast growing and superior growing sustainable energy source due to low instalment cost. It is a well known fact that after US and the China, India is the world's vast greenhouse gas emancipation country occupies 16% of energy generation of the total energy generation of 315,426 MW. A variety of applications are recorded for this wind power generation everywhere including broad power array i.e., covers kilowatt to few megawatt in the small scale and large scale off-grid impartial schemes.

The DFIG machines spurred for wind mill energy translation system due to its chief advantage of compatibility of variable speed drives. Not only the variable speed drive applications but it also supports to use low cost power electronic switches which inculcates the low cost installation capacity [1–3]. Also, the wound rotor type induction generator supports the superior performance on reactive power control so that smooth operation management is obtained. The major advantage of growing infiltration of power using wind speed consistent energy systems, it turn out to be essential to model the entire wind force systems, to learn their ability and also to study the control mechanism of the wind plant control [4,5]. However, the structure was urbanized in this paper, may utilize to all simulation category of the DFIG configurations. A constant rotating reference frame was considered in simulation design of doubly-fed configuration especially to obtain appropriate supportive operation in transient conditions. The complete design of DFIF fed wind turbine is designed in MATLAB/Simulation software to easy performance analysis [6].

2. Design of DFIF fed wind turbine system

The proposed design system of DFIG fed wind turbine system is observed in Fig. 1. The back to back connected AC/DC/AC converter was considered in the study and which is separated into two apparatus.

The two apparatus considered are as following: (i) The wound rotor face converter (C_{rotor}) and (ii) The grid face converter (C_{grid}). It is observed from Fig. 1, both C_{rotor} and C_{grid} are type of voltage source Converter with the use of high current controlled power electronic tool of IGBTs to unite an ac potential to a dc potential

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Bidirectional DC to DC converter for Hybrid Electric vehicles using Fuzzy logic controller

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ABSTRACT

This paper organizes a application of hybrid electric vehicle systems operated with novel designed bidirectional dc-dc converter (BDC) which interfaces a main energy storage (ES1),an auxiliary energy storage (ES2) and dc bus of different voltage levels. Proposed BDC converter can operate both step up and step down mode. In which step up mode represents low voltage dual source -powering mode and step down mode represents high voltage dc link energy –regenerating mode, both the modes are operated under the control of bidirectional power flow. This model can independently control power flow between low voltage dual source buck/boost modes. Here in, the circuit configuration, operation, steady-state analysis, and closed-loop control of the proposed BDC are discussed according to its three modes of power transfer. In this project fuzzy logic controller is used and also system results are validates through MATLAB/SIMULINK software.

Index Terms—Bidirectional dc/dc converter (BDC), dual battery storage, hybrid electric vehicle, Fuzzy logic controller.

1.INTRODUCTION

Overall natural change and energy supply is declining have animated changes in vehicular development. For the applications in later vehicles the cutting edge innovations are at present being researched. Among such applications, power module mixture electric vehicles (FCV/HEV) are productive and promising competitors. Previously, Ehsani et al. concentrated on the vehicles' elements to search for an ideal force speed profile of the electric impetus framework [1]. Emadi et al. discussed the functioning properties of the topographies for different vehicles including HEV, FCV, and more electric vehicles [2]. To fulfill enormous vehicular burden, for cutting edge vehicular power framework Emadi et al. additionally incorporated power gadgets serious arrangements [3]. Schaltz et al. adequately partition the heap power among the power module stack, the battery, and the ultra capacitors in light of two proposed energy-the executives methodologies [4]. Thounthong et al.studied the effect of power module (FC) execution and the advantages of hybridization for control frameworks [5]. Chan et al. audited electric, mixture, and power module vehicles and focused on designs and displaying for energy the board [6]. Khaligh and Li presented energy-capacity geographies for HEVs and module HEVs (PHEVs). They additionally examined and analyzed battery, UC, and FC advancements. Additionally, they likewise tended to different half breed ESSs that incorporate at least two stockpiling gadgets [7]. Rajashekara discussed the stream status and the necessities of fundamental electric drive parts-the battery, the electric engines, and the power hardware framework [8]. Lai et al. executed a bidirectional dc/dc converter

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Commutation Torque Ripple Mitigation in the BLDC Motor Using Fuzzy Logic Controller Based NPC Inverter

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ABSTRACT

This paper presents another power converter geography to stifle the force swell because of the stage current replacement of a brushless dc engine (BLDCM) drive framework. A blend of a three-level diode clipped staggered inverter (3-level DCMLI), an adjusted single-finished essential inductor converter (SEPIC), and a dc-transport voltage selector circuit is utilized in the proposed force swell concealment circuit. For effective concealment of force throb, the dc-transport valtage selector circuit is utilized to apply the directed dc-transport voltage from the changed SEPIC during the substitution stretch. To additionally moderate the force swell throb, the 3-level DCMLI is utilized in the proposed circuit. By utilizing fuzzy logic controller strategy can diminish the force swell really and further develop the speed accuracy and adjustment also. At last, reenactment results show that the proposed geography is an alluring choice to diminish the compensation force swell essentially at low-and high-velocity applications.

Keywords: Brushless direct current motor (BLDCM), dc-bus voltage control, modified single ended primary-inductor converter, three-level diode clamped multilevel inverter (3-level DCMLI), torque ripple, fuzzy logic controller

1.INTRODUCTION

Brushless direct current engine (BLDCM) drives are turning out to be more well known because of their powerful productivity, high force to weight and inactivity proportions, high power thickness, high dynamic response, high dependability, minimal size, and straightforward control. The BLDCMs with trapezoidal back electromotive power (EMF) are utilized broadly in clinical, flight, electric vehicles, and modern, and protection movement control applications [1]-[3]. Electronically commutated BLDCMs are profoundly dependable and require less support because of the end of high-wear parts, for example, standard mechanical commutator and brush get together [4], [5]. Notwithstanding, the throbbing force is one of the main points of contention in BLDCM. As displayed in Fig. 1, the BLDCM has a trapezoidal back EMF waveform, and a stator is taken care of by semi square wave line current. Normally, stage winding self-inductance misshapes the ideal semi square wave line current, which makes the force swell [4].

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Solution to Dynamic Economic Dispatch Problem by using Dragonfly Algorithm

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ABSTRACT

The Dynamic Economic Dispatch (DED) problem is addressed in this article using a novel optimization algorithm known as the dragonfly algorithms (DFA). The DED problem considered the dynamic change of load within a day. With the addition of practical constraints such as valve-point loading effect and ramprate limits, the DED problem behaves as a non-convex, non-linear, non-smooth problem. DFA inspired from the static and dynamic natures of dragonflies to deliver optimum solution for the problem. The applied method techniques improve the search capability and convergence propertyand implemented on four distinct test systems. The validation of the proposed method on the DED problem demonstrates its efficacy for generation scheduling and estimation.

Key words: Dynamic Economic Dispatch (DED), Dragonfly Algorithm (DFA), Ramprate limits.

1.INTRODUCTION

The optimal operation of an electrical power system is determined by its dependability and higher economy. Economic dispatch makes a significant contribution to optimal power system operation solutions. ED targets to produce electricitywith the lowest possible cost amongstthe entire committed generators in order to meet load demand while taking into account operational and practical constraints. The Practical constraints like of thevalve's effect, the dynamic behavior of ramp rate constraints, power transmission losses, and prohibited operating zones transform the conventional and convex problem into a non-convex and non-linear type. The article concentrated primarily on one characteristic and aspect of economic dispatch, Static Economic Dispatch for a predetermined time period. Dynamic Economic Dispatch (DED) is a method of improving economic dispatch by gradually focusing on the vibrantand random feature of load demand for diverse operating time periods [1]. Dynamic economic dispatch is a method of achieving the optimal production of power by scheduling it among the available generation units for a given time period in to satisfy the load demand while keeping all operational and practical constraints in mind. DED for thermal power plants is animportant optimization problem as the fossil fuel based generators meet the majority of load demand. The DED emphasizes lowering the variable cost of the fuel used in power generation. Because of the valve point loading effect and practical constraints, the complexity of non-convex and non-linear characteristics increases. Primarily, the dynamic economic dispatch problem is solved using traditional methods such as dynamic programming (DP) [2],quadratic programming (QP) [3],non-linear programming (NLP) [2], and so on. The solution of DED using traditional methods for huge power systems was

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Bi-directional Charger for Grid-tied Electric Vehicle with Hybrid Integration of Renewable Resources

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ABSTRACT

A hybrid renewable energy plant for Hybrid Electric Vehicle (HEV) that is based on solar and wind energy conversion systems is designed and analysed in this paper. Each separate energy conversion system is controlled either using regular PI controller or Perturb and Observe algorithm. The solar plant model is constituted by connecting photovoltaic (PV) panels serially and energy conversion is performed with maximum power point tracking (MPPT) algorithm that controls the modulator of buck converter. The MPPT algorithm utilized in the control step of converter is developed using Perturb and Observe (PO) that is extended with PI controller. The wind energy plant is designed with a permanent magnet synchronous generator (PMSG), and the AC–DC conversion stage is constituted with an uncontrolled full-bridge rectifier. All the converter outputs are connected to a busbar over interphase transformers (IPTs). The DC bus-bar voltage is supplied to a full bridge inverter to generate three-phase AC voltages at the output of inverter. The three-phase inverter is controlled with sinusoidal pulse width modulation (SPWM) scheme, which is developed with phase shifted carrier signals. A bi-directional DC-DC converter containing both buck and boost is used for charging the electric vehicle

Key words: *Perturb and observe, Photo voltaic, Sinusoidal pulse width modulation, Bidirectional DC-DC converter, 3 phase inverter, PI controller, Maximum power point tracking, Modulator of BUG converter, Boost converter*

1.INTRODUCTION

The utilization of conventional energy sources such as coal, natural gas, and crude oil causes increased generation costs in electrical energy besides their pollutant effects to environment. The renewable energy sources are paid much attention and are began intensively to be studied after the oil crisis met in 1970s [1,2]. Although the main aspects of studies performed in renewable energy are seen as cost related, efficiency and alternative source issues are also researched to improve the dissemination of renewable energy sources. On the other hand, governments define the sustainable energy management and energy 17 efficiency policies strictly, and financial regulations are performed for individuals to accelarate the renewable energy usage [1]. Although the renewable energy sources draw nonlinear characteristics when compared to nuclear and thermal energy sources, they do not have any pollution effect to environment. The most widely used renewable energy sources in electricity generation can be listed as solar, wind, hydraulic and tidal sources. Researchers separately studied these sources for a long time to increase energy alternatives and efficiency. However, it is possible to develop hybrid renewable energy conversion system owing to widely performed distributed generation studies. The hybrid system studies are assumed to contain some of the renewable energy sources together such as mentioned previously. The distributed power

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Improvement of Power Quality using Optimization Based PV Integrated Multilevel Inverter

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ABSTRACT

In recent periods, the design of utility network is highly crucial in power system due to large changes in the approaches of the power supply. The primary duty is to provide better power quality of power to the distributed consumers. Thus, the utilities are always emphasing on advanced methodologies to supply good power quality (PQ) to its consumers. Further, as there is wide requirement of energy demand, it is necessary to incorporate different distributed supplies to the system. Therefore, in this paper, a photovoltaic (PV) combined multilevel inverter (MLI) for enhancing the PQ in the utility network. For operation of the multilevel inverter a newly developed optimization technique is employed. The proposed method is related with other existing methods. The PV system is also operated using a modified version of the conventional maximum power point technique (MPPT). The overall performance of the system is verified and analysed using MATLAB/Simulink software.

KEYWORDS: Multilevel inverter, maximum power point technique power quality, total harmonics distortions.

1.INTRODUCTION

It is an extremely challenging job to deal with the power quality (PQ) improvement schemes provided into power system with huge penetration of the distributed resources.The distributed resources are widely implemented and needs new methods for operating and managing the utility network so as to maintain the consistency and quality of source power.

Furthermore, the liberalization of the electricity grids directs to a new organization strategy, where the energy and power trading is an important aspect. The semiconductor devices perform an essential part in the integration of distributed resources into the utility network and rapidly increasing because the applications become more incorporated with the grid integrated networks. The PV sources are treated as one of the the most favourable sources in the power system. The PV incorporation and harmonics reduction are two major challenges in the modern power distribution system [1]. Different types of PQ issues may happen in utility network which may completely danger the consistency of the supply network.

In industrial, commercial and domestic sector, the non-linear loads are used widely. These loads generate the harmonics in the utility network. Due to this distorted harmonic current, supply voltage gets distorted. The harmonics puts some adverse effects on the system like: faulty of sensitive equipment, resonance concerns, conductors overheating and the point of common coupling (PCC) becomes disturbed because of harmonic fall in the network impedances.

In recent trends the design of MLI has appeared substitute role in the range of high-power medium-voltage energy control. MLI provides merits

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Modified PSO based MPPT algorithm for solar panels under partial shading condition

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ABSTRACT

The MPPT controller approach is completely responsible for the solar system's efficiency. Popular techniques such as P&O and IC, on the other hand, fail to achieve the global minima point under various irradiance conditions. This is most common when there is only a little amount of snow on the ground. As a result, a number of techniques have been created and compared to the suggested Practical Swarm Optimization (PSO), a heuristic approach. The four such MPPT algorithms such as P&O, I&C, and PSO are experimented and the PSO algorithm resulted in better power tracking capability under shedding condition.

Keywords: PV system, partial shedding, MPPT, PSO, I&C, P&O

1.INTRODUCTION

Energy participation is critical for the globe, which is reliant on resources such as nuclear and fossil fuels. However, they raise the danger of environmental damage, drawing attention to the need for an alternative, non-conventional energy source.

Photovoltaic solar system systems (PV) are the most common renewable energy source because they are clean, safe, and can be deployed with no fuel costs, no maintenance, and no noise or pollution. The MPPT controller approach is completely responsible for the solar system's efficiency. Popular techniques such as Pertub and Observe (P&O) and incremental conductance (I&C) fail to achieve the global minima point at various irradiance levels. Although the PO method is a more straightforward approach to MPPT, it tends to cause oscillations around the global minima point, which fails under quickly changing environmental (temperature and irradiance) circumstances [1].

The I&C algorithm, on the other hand, performs better in such settings despite being significantly more critical in nature [1-2]. Other strategies, such as constant voltage or constant current approaches, are likewise simple to implement, but they do not effectively track the maximum point [1-2]. The beta approach, on the other hand, has a decent ability to track MPP circumstances but is computationally demanding and requires careful selection of the beta-factor [2]. For partially shedded situations, the entire method fails. As a result, several techniques have been devised, which are further debated and scattered throughout the literature.

While certain MPPT approaches are appropriate for small scale solar systems, they fail in big systems owing to partial shedding. As a result, none of the MPPT techniques mentioned above are adequate for achieving the global MPP under partial shade conditions. Under such conditions, numerous techniques [11, 16] are the global tracking method; however they are not very efficient and have a higher computational cost. In this paper, the particle swarm optimization (PSO) technique,

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Adaptive PV Module Integrated Converter Operated in Standalone and Microgrid Connected Modes using Hysteresis control

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ABSTRACT

Micro grid interconnected solar system has demand in the market due to zero fuel cost. But the drawbacks of low efficiency due to dc-to-dc converters and high switching frequency results in aging effect in the input. To compensate the above problems a new method is introduced for dc to dc converts which can be replaced by interleaved converter. The interleaved converters perform high dc conversion and also switching frequency modulation. module integrated converter (MIC) which controls the converter for smooth operation. This project focus on maximum power point tracking (MPPT) based DC-DC convert for power control. An adaptive control scheme is used for better power control. Switching frequency control is adapted for faster control and to increase the output voltage. The switching frequency is optimally modulated as a function of solar irradiations. Variation in the solar irradiation is optimally control for and output power is regulated. DC-DC converter is operated as module integrated converter (MIC) for high voltage generation. A Hysteresis controller is used to reduce the output ripples and to increase the output voltage level. This project is carried out using MATLAB/SIMULINK software.

KEYWORDS:Micro grid, MPPT, Solar Energy, Hysteresis Controller.

1.INTRODUCTION

Most of the world's energy consumption is currently met by fossil fuels such as petroleum, coal, and natural gas, which are rapidly depleting. One of the most serious challenges of global warming is carbon dioxide, which is produced by the combustion of fossil fuels and poses a serious threat to life on our planet.

Among all Renewable energy sources, PV array system plays a vital significant role in renewable energy production. Solar systems transform sun energy into electrical energy as dc. These systems generate lower voltage. Step-up dc/dc converters are used in vast applications, including wind power, fuel cells, and solar systems. Due to the increasing requirement on electricity, and less availability and big cost on non-renewable sources, the solar energy conversion has become an alternative as it is wind power, freely available and has low maintenance cost. Therefore, the use of solar cell energy systems has to be improved for grid-connected and as well as standalone modes. Photovoltaic (PV) as a renewable energy resource naturally is not stable by location, time, season cost for installation should be considers and also the material [1]. A very important consideration in improving the efficiency of solar systems is to operate the sloar system at maximum power

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Artificial Neural Network based grid integrated wind MPPT system

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ABSTRACT

Increasing demand of PMSG based wind system as a renewable energy resource needs to track its maximum power using effective algorithms. As wind system has uncertainity in the wind speed, accordingly its MPP also varies. Although various algorithms have been propose, still there is a need of developing effective MPPT algorithm that can track the global maxima. Presently an ANN based MPP algorithm is proposed and compared with P & O algorithm. Also further the model is validated under varying wind speed and connected to grid. The results strongly suggest the proposed ANN approach over P & O method.

Keywords: Wind system, MPPT, P&O, ANN, Grid.

1.INTRODUCTION

The role of energy is critical for the globe, which is typically reliant on resources such as nuclear, fossil, and so on. However, they raise the danger of environmental damage, which has attracted attention to the need for an alternative, nontraditional source of energy. Wind and solar power systems (PV) are the most common renewable energy sources because they are clean, safe, and can be deployed with no fuel costs, little maintenance, and no noise or pollution.

The MPPT controller technique is completely responsible for the wind system's efficiency. However, common techniques such as Pertub and Observe (P&O) and incremental conductance (I&C) fail to achieve the global minima point under various wind conditions. Although the PO method is a simpler solution for MPPT, it typically generates oscillations around the global minima point, which fails under quickly changing environmental (temperature and irradiance) circumstances[1]. However, the I&C algorithm performs better in such environmental settings despite being considerably more critical in nature [1-2]. Other solutions, such as the constant voltage or / and constant current approaches, are likewise simple to construct, but they do not correctly track the maximum point [1-2]. The beta-approach, on the other hand, has a decent capacity to handle MPP situations but is computationally cricital and requires a suitable selection of beta-factor [2]. For partially shedded situations, the entire method fails. As a result, several techniques have been devised, which are further debated and scattered throughout the literature. Although certain MPPT strategies are appropriate for smallscale wind systems, they fail in big systems owing to partial shedding. As a result, all of the aforementioned MPPT techniques are unsuitable for achieving the global MPP under fluctuating wind conditions. Under such conditions, numerous ways [11,16] are the global tracking method, however they are not very acceptable in terms of efficiency and have a higher computational cost. The current literature employs a well-known heuristic

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Fuzzy logic based grid integrated solar system using PSO-PI Active Power Filter for THD reduction

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ABSTRACT

The solar system is generally characterised by the VI char-acteristicsandarerepresentedwiththePVcurve.However,dueto rapidly varying condition the curve generally follow a nonlinear characteristics. Thus the proposed work a Fuzzy basedsystem is proposed for global MPP tracking. The performance is obtained better as compared to others as the convergence is faster and reaches the global MPpoint.The proposed grid integration system is connected with nonlinear load which causes harmonics. Also the integration of grid and theloadeffectsthesolarPVsystem.So,proposed workt ries to reduce the harmonics in the system by shunt connected Active Power Filter (APF). the prposed APF model is studiedunder various controller operation including the PID and thePSO-PID operation. Along with this the passive filter is alsostudied and the preliminary findings are reported. As a whole,the PSO-PID based hybrid (Active and Passive) APF systemresulted better harmonic reduction in comparison to the otherstate of art approaches. The obtained results are presented inthe form of figures and justifications have been carried outfurther.

1.INTRODUCTION

In general the loads are non linear in nature. This resultsthe grid integrated system to create harmonics and becomesunbalanced. due to the continuous increase in power unbalancethe quality degrades.Hence the flow of the power generallyflows to the house hold circuits and may damage the system.

So a proper control on the harmonics and reactive powershould be implemented in order to improve the power systemstability which is aimed with the help of a Solar model in thepresent literature.

In concern to the power quality, the domestic load playsan vital role in it. Power transmission system heats up dueto the varying resistive loads leading to varying RMS values.Different batty systems with capacitors and synchronous machinesfor reactive power compensation have been proposed inthe last decade. The recent development on powerelectronicsdrives and semiconductor devices have emerged which use theSTATIC VAR compensators for compensating the the reactivepower. Along with this various solutions seems unstable andgenerally cause further problems in power system qualityfor the high current and voltage harmonic emissioncases.Although behind the fact that they areespecially modelledto compensate the reactivepower but are unable to operate inseveral real time situations.

Generally the traditional techniques include the active incorporationof the RLC elements inorder to compensate thepower satability problem. Along with this also various filterscan be designed for the compensation of the reactive powersimultaneously with the desired harmonics. Also being implementedstill these solutions are of reduced efficiency due toseveral factors [3].

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Design of ANN Based Bridgeless Landsman Converter for Power Factor Correction in Electric Vehicle

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ABSTRACT

The Electric Vehicles (EV) are gaining immense popularity owing to its several attractive advantages like battery storage, minimum carbon footprint in addition to being eco-friendly. Electric cars bring a change in both the transportation and electricity sectors, and by merging the two, they have the potential to benefit both. This linkage necessitates the deployment of effective Power Factor Correction (PFC) techniques for charging EV batteries, which reduces the supply front-inherent end's Power Quality (PQ) issues. For PFC an efficient Bridgeless Landsman converter, which is capable of monitoring link voltage is adopted in this work. A PI controller based on an Artificial Neural Networks (ANN) is used, which aids in prediction and classification in terms of response time. The hysteresis controller is linked to a PWM generator, which calculates the converter's steady-state switching frequency and gives accurate results. The proposed method assists in successful minimization of harmonics with heightened efficiency.

Keywords: Bridgeless Landsman Converter, ANN, PWM generator, Hysteresis controller, PI controller

1.INTRODUCTION

EVs contributes significantly to the improvement of sustainable and efficient transportation by subduing the effects of global warming challenges, increased emissions, limited supplies of fossil fuels, and booming fuel prices [1]. Renewable energy based power generation and EVs are intended to provide a permanent solution to these issues. Electric vehicles (EVs), which are seen as a viable mode of transportation, have gotten a lot of attention since they meet the demand for a sustainable transportation while also improving battery technology [2]. The quality of input power and output power in EVs is regulated using a process known as PFC, however the available PFC techniques are affected by losses and not suitable for huge load transients [3]. The aforementioned limitations are tackled by combining the converters with PFC [4].

Fundamental boost converters, among other converters, in ideal settings have high boosting ratio, but they are not practical. It raises the minimum input voltage to a higher range without using a high duty cycle, however the voltage stress and effect on the circuit's dynamics produce variations. As a result, a higher-rated switch is required for this converter to operate better [5]. The short comings of boost converter is overcome using buck-boost converter, which is capable of both voltage bucking and boosting, however its input current being discontinuous limits its operation [6, 7]. As a result, the CUK converter is used to improve the voltage gain of the PV system. This converter has the advantage of reduced switching loss and better voltage regulation. However, for the PV module's minimum voltage, its step-up static gain is insufficient [8]. The inverted output of both Cuk and buck-boost converter also limits its wide

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Battery Monitoring System and SOC Enhancement Analysis using Artificial Intelligence Technique

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ABSTRACT

A Battery Energy Storage System (BESS) is generally used for storing the excess power produced from the solar PV panel during the daytime when the availability of sunlight is high and it supplies the stored electrical energy whenever it is needed. The accurate estimation of the State of Charge (SOC) of the battery is considered to be very essential for proper power management and reliable operation of the battery. In this paper, a SOC monitoring system for BESS based on Probabilistic Neural Network (PNN) approach is proposed. The PV panel output voltage is enhanced and made distortion free by SEPIC converter with the assistance of PNN controller. The output thus obtained from the converter is used for many DC applications. The performance of the proposed battery monitoring model is evaluated by using MATLAB simulation.

KEYWORDS: PV panel, Battery, SOC, PNN controller, SEPIC converter, PWM generator.

1.INTRODUCTION

In recent times, the world has started to recognize the need to invest and expand renewable energy sources for power generation in order to combat climate change and advance towards a carbon free future. Among all renewable energy sources, solar energy is gaining more prominence due to the steep decline in the price of PV panels. The PV system is a type of power generation system that harnesses solar energy to generate electric power by utilizing the principle of photovoltaic effect [1]. The PV output voltage tends to fluctuate from time to time owing to factors like temperature, insolation and climatic conditions. Hence, a proper Power Conversion System (PCS) is needed to transfer power from solar PV panel to Grid and various loads. In grid connected PV system, the PCS comprises of a DC-DC converter to perform both voltage step up as well as voltage step downoperation and an invertert toperform DC to AC power conversion [2,3].

The PV system delivers low output voltage that is converted into a high DC voltage as per the requirements by implementing different types of DC-DCConverters like boost converter [4], buck-boost converter [5], Cuk converter [6], etc. The performance of the converter is considerably enhanced with the usage of efficient control techniques, which includes conventional controllers and Artificial Intelligence (AI) controllers [7]. In [8], conventional Proportional Integral (PI) controller is used for the purpose of regulating the DC variables but the performance of the controller is affected by sudden changes in the PV parameters. To deliver improved DC voltage with minimum loss, AI techniques such as Artificial Neural Network (ANN) [9] and Fuzzy Logic Controller (FLC) [10] are adopted. The ANN approach generally requires more computational time to train and

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PV-Battery Hybrid System with Multi-Mode Power Converter for Electric Vehicle Charging Station

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ABSTRACT

As an environmental friendly vehicle, the increasing number of electrical vehicles (EVs) leads to a pressing need of widely distributed charging stations, especially due to the limited on-board battery capacity. However, fast charging stations, especially super-fast charging stations may stress power grid with potential overload at peaking time, sudden power gap and voltage sag. This project discusses the detailed modeling of a multiport converter based EV charging station integrated with PV power generation, and battery energy storage system. In this project, the control scheme and combination of PV power generation, EV charging station, and battery energy storage (BES) provides improved stabilization including power gap balancing, peak shaving and valley filling, and voltage sag compensation. An ANN based controller is designed for regulating performance of multi-mode power converter.

1.INTRODUCTION

The continuous rise in gasoline prices along with the increased concerns about the pollutions produced by fossil fuel engines are forcing the current vehicle market to find new alternatives to reduce the fossil fuel usage. Along with the research on bio-fuel driven engines; different electric vehicles and hybrid electric vehicles are evolving as viable alternatives to replace, or at least reduce, the current fleet of fossil fuel driven vehicles. Although current manufactured electric/hybrid vehicles are being marketed as a way to reduce fossil fuel usage, several promising technologies

are being demonstrated that can utilize power electronics to charge the battery from the utility using plug-in vehicles or act as a distributed resource to send power back to the utility with vehicle-to-grid capabilities. In this paper, different plug-in vehicle topologies are described to review the power electronics required for them. The newly evolving V2G technology is also discussed along with economics and compliance requirements to allow the vehicle to be connected to the grid. Before going into the details of power electronics required for the electric/hybrid vehicles, the common forms of these vehicles are described next to get accustomed with the terminologies.

2. ELECTRIC VEHICLES

A typical electric vehicle (EV) has a battery pack connected to an electric motor and provides traction power through the use of a transmission. The batteries are charged primarily by a battery charger that receives its power from an external source such as the electrical utility. Also during regenerative braking, the motor acts as a generator which provides power back to the batteries and in the process slows down the vehicle. The primary advantage of an EV is that the design is simple and has a low part count. The primary disadvantage is that the driving range of the vehicle is limited to the size of the

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Wind Energy Conversion Systems Based Energy Management in Vehicle-to-Grid Systems using LUO Converter

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ABSTRACT

Nowadays, the vast increase in population has raised the count of people using vehicles, due to which high pollution as well as global warming occurs. Moreover, due to high degradation of fossil fuels, high energy demand occurs all over the world, leading to the requirement of an alternate energy sources as a compensation. This accelerated the way for the utilization of Renewable energy sources (RES), which are available throughout the year and are of reduced cost. Nevertheless, as the fuel cost of internal combustion engine-based vehicles increases, most of the people in today's situation prefer Electric vehicles (EV) and recently, the RES based EV's are attaining high attraction. This paper proposes a Wind energy conversion system (WECS) fed LUO converter based electric vehicle system. Initially, the AC supply from the WECS is applied to the Rectifier, in which it is converted into DC supply. Since the DC supply attained is low, it is boosted with the help of DC-DC LUO converter. Further, through a Voltage Source Inverter (VSI), it is given to the grid. The extra energy from the Wind energy system is stored in the battery through a Bi-directional battery converter, which is further employed for Electric vehicle applications. The proposed technique provides continuous power supply to the Electric vehicles without any interruption, thus providing *efficient energy management with high efficiency and low THD.*

KEYWORDS: Renewable energy sources (RES), Electric vehicles (EV), Wind energy conversion system (WECS), Voltage Source Inverter(VSI)anTotalHarmonicdistortion(THD).

1.INTRODUCTION

In today's world, due to greenhouse gases like carbon dioxide, there is great increase in global warming. In order to decrease the greenhouse emissions, many countries move towards clean and renewable resources like wind, solar, etc. There is great increase in the energy demand, during recent years, as there is high degradation in the fossil fuels. Moreover, for reducing the employment of carbon, in transportation, an eco-friendly mobility and enhancement in the relevant infrastructure are promoted [1]. It is found that, around world-wide, there is increased penetration of wind energy systems and its global share is about 19% of total RES installation. The generation types of WECS include DFIG (Doubly fed Induction generator), PMSG (Permanent magnet synchronous generator) and SCIG (Squirrel cage Induction generator) systems. As wind energy systems rely on the speed of wind, it gives out a fluctuating nature. Due to this, the loads connected in the utility grid faces frequent variations in the necessary real and reactive power. Moreover, the use of energy storage

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A Hybrid Energy Storage System in Electric Vehicles using RNN Based Battery Management

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ABSTRACT

There is high acceleration in the growth of Electric vehicles (EVs), due to the poor fuel economy and increased pollution rate. Normally, the EVs gets supply from the grid and in order to provide uninterruptible power supply, Renewable energy sources (RES) based Electric Vehicles are introduced. The use RES adds benefits like reduction of overload at local grids and also extends the grid flexibility. However, the PV suffers from voltage fluctuations due to frequent changes in the irradiation of Sun. Therefore, for boosting the output of the PV system, a novel DC-DC SEPIC-ZETA converter is proposed in this paper. To track the maximum operating point of PV system, a Perturb & Observe (P&O) MPPT algorithm is used. The output of the dc-dc converter is given to a high frequency isolated Flyback converter, in which the DC supply is transformed into high frequency AC supply. Further, the AC output is sub-divided into five portions and through individual rectifiers, the AC is converted into DC supply and fed to multiple battery ports. Then, for maintaining the State of charge (SOC) of the batteries, a Recurrent neural network (RNN) is employed. The use of high frequency fly back converter reduces the number of sources used and also assists in supplying power to multiple batteries of EVs. Moreover, the proposed work is implemented in MATLAB/Simulink platform for investigating the performance. The defined work has less power losses, provides better energy management in EVs, reduces the number of DC sources used and uninterruptible power supply.

Key Words: Electric vehicles (EVs), Renewable energy sources (RES), Perturb & Observe (P&O), Maximum Power Point Tracking (MPPT), Single ended primary inductance converter (SEPIC), State of charge (SOC) and Recurrent neural network (RNN).

1.INTRODUCTION

The novel innovations and the technical developments have moved the world to an updated condition with all necessary facilities. Along with that there is steep increase in pollution, which produces harmful effects to the human beings. The normally used internal combustion-based vehicles possess high emission rate and also adds more to the pollution, resulting in increased greenhouse effect.This led to the introduction of Electric vehicles (EVs) with energy storage systems [1]. The increased environmental awareness and fossil fuel depletion has made the modern societies to prefer Renewable energy sources (RES) instead of Non-Renewable energy sources. In today's world about 80% of the total energy supply relies on the fossil fuels, in which the transportation and the electricity generation are the main consumers. The RES based EVs are becoming popular as it is pollution free and easily installable. The energy storage system (ESS) plays the main role in EVs and the cost effectiveness and the performance of the EVs relies on the ESS. The EVs are considered to be a significant alternative to the conventional vehicles and when RES based EVs are preferred, greener energy along with better transportation is attained [2, 3]. Around worldwide, the Photovoltaic system (PV) has been used to meet the

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Cascaded Fuzzy Logic Control for Energy Management of Hybrid Electric Vehicles

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ABSTRACT

This project proposes an energy management Hybrid Electric Vehicle using cascaded fuzzy control approach. Hybrid electrical vehicles are economical and effective alternative, different to the traditional fuel engine vehicles and therefore efficient and intelligent energy management is that the key for establishing a major marketplace for the hybrid electrical vehicles globally. The energy management issue becomes important so as to boost the autonomy of hybrid electrical vehicles and to scale back the prices. This project presents improvement of the battery performance of a hybrid electric vehicle using Cascaded Fuzzy Logic Controller (CFLC) for the control. The battery along with a PV system is utilized as energy sources. A SEPIC integrated boost converter is utilized for the enhancement of power from the PV system. The output of converter is fed to the grid through a 1Φ VSI, which converts the DC voltage into AC voltage. The LC filter is employed to enhance the output of the inverter. MATLAB/Simulink environment is used to simulate the performance of the proposed system.

Keywords: PV system, SEPIC integrated Boost converter, Cascaded CFLC, PI controller, 1φ VSI

1.INTRODUCTION

An efficient transportation and energy producing system with a lower carbon footprint is being promoted in recent times owing to growing concerns about the detrimental effects of global warming and climate change. The primary sources of hazardous carbon emissions in the atmosphere are fossil fuel-based automobiles and electricity producing systems. As a result, the adoption of PV-powered electric vehicles is critical in delivering a viable response to global warming. Electric vehicles are a more environmentally friendly means of transportation, with zero carbon footprint and enhanced eficiency. PVs are also emission feee renewable energy that can be produced anywhere, including urban areas, to drive EV applications. Since the PV system are non-linerar with low voltage output, a DC-DC converter is essential in improving its low output voltage [1-5]. The fundamental converters like boost are predominantly used for PV applications, but they are limited by their inability to offer step down voltage conversion. The buck-boost converter are capable of both increasing and decreasing the voltage level but its efficiency is affected by its discontinuous input current. The SEPIC converter, which also comes from the buck-boost family is capable of both voltage step down and step up but its input current ripples is very large. So, for improving the working and efficiency of fundamental converters, integrated coneverter are developed. The integrated converters has wide range of voltage conversion ratio in addition to reduced switching loss [6-9].

A suitable controller is essential in improving the operation of the converter. The traditional PI controller

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GWO based PI Controller for Energy Management in Hybrid Electric Vehicles

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ABSTRACT

In the present decade, there is high environmental pollution, increase in fuel cost, high fossil fuel depletion and increased consumer expectations, which resulted in the vast growth of Electric Vehicles (EVs). Moreover, as the normal internal combustion engine based vehicles emits high pollution, there is increased for demand for Renewable energy sources (RES) based EVs. Among them, the PV relied EVs are highly significant, since it is available throughout the year and easily installable. However, the intermittent nature of PV system causes voltage fluctuations. Therefore, it is necessary to boost the output of the PV system. In this paper, an improved DC-DC SEPIC converter is used for enhancing the PV output, which is further used in EV applications. The DC link voltage at the output of the DC-DC converter is maintained constant using a Grey Wolf Optimization (GWO) based closed loop technique. Further, the output of SEPIC converter is given to the Voltage source inverter (VSI), in which it is converted into AC supply and is fed to the EV or grid. The grid synchronization is attained with the help of PI controller. The proposed work produces reduced THD, lower switching losses, also assists in maintaining better energy management at the EVs, thereby providing uninterruptible power supply. Furthermore, to evaluate the performance of the proposed work, it is implemented in MATLAB/Simulink.

Key Words: Electric Vehicles (EVs), Renewable energy sources (RES), Single ended primary inductance converter (SEPIC), Grey Wolf Optimization (GWO), Voltage source inverter (VSI) and Total harmonic distortion (THD).

1.INTRODUCTION

In the recent decades, high energy scarcity and the increase in energy concerns occurs, leading to the emergence of promising strategies like Renewable generation and Transport electrification. On a statistical view, it is found that about 90% of the passenger vehicles are in idle condition and the parking time of the vehicles are very high compared to the time taken by the battery of the vehicle to get completely recharged. The Plug-in-Electric vehicles (PEV) along with batteries acts as an efficient alternate source for the normal internal combustion engine-based vehicles and the EVs are eco-friendly in nature [1]. According to [2], in 2016, there were 2.3 million charging stations for electric vehicles and are normally grid connected. However, in order to attain the basic advantages of Electric vehicles (EVs) like reduced pollution, decreased fossil fuel dependency and high energy security, the Renewable energy source (RES) based EVs are preferred. Among the different types of RES like Solar, wind, tidal, etc. solar based EV charging station is easily accessible. Most probably, in all the charging stations, the PV array is connected to the station with the aid of a DC-DC converter [2]. Since the irradiation from solar system is irregular, there are frequent variations in the power transfer amid the PV system and the grid. Hence a DC-DC boost converter is

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Robust trajectory tracking with non-singular terminal sliding mode control of a mobile manipulator

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ABSTRACT

This effort addresses and uses a robust-trajectory-tracking control system for kinematically redundant location tracking of a mobile manipulator (mobman) in its task space in the presence of parameter uncertainties and external disturbances. It consists of a serial manipulator with four degrees of freedom (DOF) fixed on three DOF mobile bases. A robust tracking control is achieved using the configuration of a non-singular terminal sliding mode (NSTSM) control for the entire non-linear model of a mobman. Because of the non-linear added term in the linear sliding surface, which reflects in the non-linear sliding mode known as terminal sliding mode (TSM), this control preparation satisfies systems states finite time convergence. Similarly, conventional terminal sliding mode control (CTSMC) entail singularity trouble, which is tackled by the control scheme. (Computer based) simulations are used to demonstrate the convenience, feasibility, and robustness of given techniques.

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1. INTRODUCTION

To optimize the robot's reliable and fast-tracking execution, robust quick tolerant-adaptive-control has been planned. It brings a maximum degree of strength, a quick transitory response, and a finite time convergence method [1]. For a given tracking control scheme, a back stepping control tactic is settled to elude singularity-point matter [2]. Trendy master-slave configuration for a group of mobile robots, path planning based on artificial potential field (APF) united with tracking control mechanism based on FAGNTSMC here [3] the authors have submitted. The authors have suggested an adaptive-fast and stable control way to control robotic manipulator with n-degrees of freedom n-(DOF) [4]. In presence of uncertainties, the non-singular terminal sliding mode control (TSMC) is proposed plus applied to a non-linear four-linked selective compliant assembly robot arm (SCARA) robot-manipulator [5]. Mobile-manipulators have been employed effectively to perform not only effective but also interactive practical assignments like drilling operations and laser cutting, choose an object relocation plus complex surface painting or arc welding, peg-hole addition, and over a long time [6]. Collision avoidance compliance and matter of singularity is defined using an external forfeit utility tactic, domino effect in bounded plus continuous control of mobman even near disturbance limits. Using random profile technique, control the movement of the mobile-manipulator so as to complete a task of pick up.

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An Asymmetric 21 Level Inverter for Motor Load using PV Fed SEPIC Converter

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ABSTRACT

The significance of Renewable Energy (RE) Sources in the process of enhancing the function of motor load is remarkably high in the recent scenario as it is wrapped with bunch of beneficial impacts like minimum cost, easy availability and maintenance free approach, which initiates the preference of RE sources in this present work to satisfy the load demand in an efficient manner. For maximizing the PV output voltage in a wider range, the Sepic converter is significantly employed in this work, which involves in improving the operation of the over all system in an efficient manner whereas the process of accomplishing the Maximum PowerPoint Tracking (MPPT) is significantly achieves with the assistance of ANFIS approach. The compensation of load demand is remarkably attained with the assistance of a 21 Level (31L) Inverter Multi Level Inverter (MLI) is in an optimal manner, which in turn maximizes the reliability of the entire system without any complexities. The entire system is simulated using MATLAB Simulink and the obtained outcomes have proved that the proposed approach delivers optimal performance as is lessens the Total Harmonic Distortions (THD) to a greater extent.

KEYWORDS: PV System, Sepic Converter, MPPT, ANFIS, MLI, THD

1.INTRODUCTION

The RE sources are in great demand in the power generating process to meet people's power needs and to efficiently overcome fossil fuel exhaustion, because of which it is significantly preferred in various domestic and industrial applications as it operate well in enhancing the system performance with multiple advantageous features like maintenance less nature, minimum cost, zero emission of harmful CO_2, trouble free installation, etc. Moreover, the usage of these RE sources has reached extensive attention among the people in the recent scenario because the people find it hard to prefer the existing fossil fuels because of the rapid increase of cost and so the people tend to prefer the usage of RE sources to meet the daily power demand. In addition, the influence of preferring RE sources in the economic growth of the country is extensively high in and so it has gained much attention among various people in various sectors [1-4]. Among various RE sources, the solar energy is much advantageous as it is wrapped with multiple beneficial measures like easy availability, less cost, anywhere anytime installation and eco-friendly nature. As it is highly beneficial, it is preferably used in various applications since the pollution free nature of PV is in high demand for the enhancement of eco-friendly nation [5-6].

In spite of having multiple advantageous elements, the low output voltage of PV restricts the usage of PV in many applications and so the DC-DC converters are employed to enhance the PV voltage in awider range.

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Ultra Gain Boost-Z Source Converter for Transformer Less Fuel Cell Integrated Single Phase Grid System

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ABSTRACT

DC-DC Boost Converters with maximum voltage gain are globally utilized in grid connected applications through integration with Renewable energy resources. With the focus of minimizing conversion losses, the kay is reducing the costs and size by eliminating transformer and other power devices. This paper proposes a High gain Converter for HVDC and Fuel based applications. The proposed boost-z source converter structure reduces the number of input DC sources and Switches. The high gain topology with low duty cycle suppresses the switching stress and switching losses. The Blocking diodes provide snubber protection for the proposed converter topology. The PI controller is used for Closed loop Steady state voltage operation in the converter. Grid Synchronization technique is used for mitigating the power quality issues. This project is developed using Matlab simulation.

1.INTRODUCTION

Shortage of energy and protection of the environment have taken part in significant roles in daily life. The abrupt depletion of resources such as coal, diesel oil and natural gas trigger humans to make use of renewable resources like wind, solar, geothermal and hydroelectric energies. Renewable energy resources have been developing swiftly when weighed up with the past. Out of all the renewable energy resources Photovoltaic and fuel cells are cleaner and their significance in the power system is getting higher [1]. Fuel cell are the devices which transform chemical energy into electrical energy without pollution emission from gases. Henceforth research towards fuel cell and its applications have attained high attention for its maximum efficiency for energy conversion. Single phase inverters with fuel cells are generally designed to generate reliable and high quality power for loads with system sensitivity in case of power failure. The major problem is output of the dc side may be reduced in single phase system due to second order current ripple. To overcome this problem, a boost inverter with Differential Mode (DM) and Common Mode (CM) is utilized. The DM operation attains power conversion actively and a well-regulated ac output voltage. Whereas, CM operation helps in reducing dc current ripple [2]. Generally voltage produced by fuel cells has a minimum value (0.5 to 0.9V), which makes it mandatory to join a number of cells in series to provide a high value voltage. Owing to the various types of fuel cell, cells that produce watts up to megawatts of power per module. Conventionally, cell efficiency is between 40% and 60%, but when combined in cycles of heat and power (CHP), fuel cell attain efficiencies of up to 85%. Detrimentally voltage output of commonly accessible

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D-Q Theory Based Three Phase Unified Power Flow Controller for Power Quality Improvement

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ABSTRACT

In this project proposes a new algorithm to generate reference voltage for a unified power flow controller (UPFC) operating in voltage control mode. The reference stator current is generated by using D-Q theory which reduce the THD in the source current. The proposed scheme exhibits several advantages compared to traditional voltage-controlled UPFC. The proposed scheme ensures that unity power factor (UPF) is achieved at the load terminal during nominal operation. The UPFC controller compensate the reactive power and also prevent voltage sag problems in the distribution system. The obtained results indicate that the proposed approach maintains sustainable environment with enhanced efficiency. The entire system is validated through a MATLAB simulation.

KEYWORDS: UPFC, D-Q Theory, voltage control, Reactive power, Stator current

1.INTRODUCTION

The economic losses and adverse effects of power quality problems such as voltage fluctuation, sag and short-term interruption on enterprises and society are becoming increasingly prominent. The demand of users for comprehensive management of multi-type power quality is becoming increasingly strong. In order to reduce the economic losses caused by the problem of power supply quality, domestic and foreign scholars have carried out a lot of research, and have obtained a lot of research results and developed corresponding management devices. To improve the power quality of the distribution network sensitive load, a power quality improvement device for medium-voltage distribution network is developed, whose power unit and topology of charging circuit is designed and a fixed voltage slow closed loop control strategy is proposed.Minimum power processing occurs at the voltage operating point at which the most energy is generated, improving the efficiency and the power yield of the PV system [1].Two control methodologies are adopted that is constant DC link voltage based control and a variable DC link voltage based control are employed in the modified dual output cuk converter fed SRM drive [2].PFC based dual output converter is designed to feed the SRM drive and such converter is a combination of Cuk and SEPIC converters. To obtain inherent PFC, a voltage follower approach is adopted [3].The overestimation of the parmeters in all these converters is less influencing than their underestimation. In-depth analysis and evaluation of MPC based MPPT methods applied to various common power converter topologies. [4].To improve the power quality of the distribution network sensitive load, a power quality improvement device for medium-voltage distribution network is developed, whose power unit and topology of charging circuit is designed [5].The

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PV Tied Grid Connected Inverter Using High Gain Reboost Luo Converter

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ABSTRACT

This project proposes Reboost Luo converter based single phase three level voltage source inverter for PV system. The solar system provides voltage to the inverter through Reboost LUO converter. The MPPT fuzzy logic algorithm is used to extract the maximum power from the PV system. The solar PV energy generation system has been scrutinized as a most prominent energy system by power producers across the world as it uses renewable energy source for harnessing electricity. However, to the increase overall production, the grid connected PV system with DC – DC reboost luo converter has been employed as it boost up the low level DC voltage from the PV panel up to the level it matches the grid voltage. By assigning closed loop control strategy along with PI controller ensures the control performance and helps in extricating maximum possible power from the PV panel. The attained voltage is fed in to the grid through a VSI by assigning PI controller that eliminates the steady state error and helps in achieving the target grid voltage by analogizing actual power with the reference power. This single phase voltage source inverter converts DC voltage into AC voltage with grid synchronization. This project is implemented using Matlab simulation.

KEYWORDS — PV, PI CONTROLLER, DC-DC REBOOST LUO CONVERTER.

1.INTRODUCTION

Under the strain of rapidly rising energy demands and diminishing fossil fuel resources, the globe faces a tremendous problem. [1]. To address this problem, the global energy system must transition to a more efficient and long-term source of energy. Renewable energy are promising alternative ideas and technology for generating electricity [2]. When compared to traditional energy sources, solar panel generation is both environmentally friendly and cost effective. Furthermore, factors such as decreased panel prices, quick efficiency gains, and the consequences of rising power bills have all contributed to a growth in demand for solar PV arrays for generating their own electricity [3-4]. As a result, the focus is on connecting renewable energy systems to the local electrical grid. The offset sections of the premise daily electricity use and the possibility to generate value by transferring extra power to the grid are the main advantages of this technology [5].

However, one of the major problems with solar power generation is that the output power from solar PV panels is irregular and stochastic, resulting in operation intermittency and fluctuations. As a result, a battery energy storage (BES) system is equipped with the system for reducing the PV power's intermittency [6]. Operating BES in islanding mode (IAM), which provides uninterruptible power to key loads linked to the system during a power loss, justifies the increased expense. In addition, by smoothing the electricity sent into the grid, BES provides the additional facilities in the grid-tied system. Many studies have developed various control techniques [7-10] to optimise the size of BES for high use.

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Multiport Bidirectional Converter for Solar fed Hybrid Electric Vehicle using Switched Reluctance Motor Drive

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ABSTRACT

In this paper, a multiport bidirectional Switched Reluctance Motor (SRM) drive is proposed for Solar Assisted Hybrid Electric Vehicle applications. The output voltage of the PV system is low and inadequate to meet the required level of voltage, so a high gain KY converter is employed for boosting the PV output. With the assistance of Proportional Integral (PI) controller, the converter output is maintained stable and fed to the 8/6 SRM through (n+1) diode (n+1) semiconductor topology. The speed of the SRM is controlled by using a PI controller. The excess power from the PV is used to charge the battery, which is connected to the DC bus through a bidirectional battery converter. The operation of the bidirectional battery converter is controlled by using a PI controller. The battery stores the surplus energy from the PV and delivers it to the SRM drive whenever it is needed. The effective performance of the proposed methodology is verified using MATLAB simulation and the results are obtained.

Keywords: PV panel, 8/6 SRM, (n+1) diode (n+1) semiconductor topology, battery, PI controller, PWM generator, KY converter.

1.INTRODUCTION

Social progress and energy growth are intrinsically tied to human survival. As science and technology improves, the contradiction that energy consumption is increasing while available fossil energy is becoming increasingly scarce [1, 2]. So people are presented with new crises and dilemmas. The only solution is the usage of renewable energy sources than the non-renewable energy sources, which is derived from naturally regenerated sources [3]. The major types of renewable energy sources are: Wind energy, solar energy, Hydro energy, geothermal energy, Biomass energy and Tidal energy.

Due to the availability of solar irradiance in comparison to other renewable energy sources, solar photovoltaic (PV) systems have recently played an important role in renewable energy systems (RESs) [4]. Solar energy [5] is pollution free and emits no greenhouse gases once installed. Even cloudy days provide some power from renewable clean energy. They have numerous advantages, including unlimited access and inexpensive. Further, Solar energy produces a more consistent amount of energy than wind energy. Solar Farms can be used to generate energy on a large scale and do not require special installation space and can be erected on the rooftops of homes or offices. The solar system might be used as a stand-alone (off-grid) or as part of a grid-connected system. The PV panel output is enhanced by implementing many DC-DC converters like boost converter [6], SEPIC converter [7], Cuk converter [8] and so on.

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Application of optimisation technique in PV integrated multilevel inverter for power quality improvement

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ABSTRACT

In recent days multilevel inverters (MI) have played an essential role to photovoltaic (PV) integrated supply systems. MI has high efficiency and is more robust compared to the traditional two-level inverter. This paper presents a modular cascaded multilevel inverter (MC-MI) based hybrid shunt active power filter (HSAPF) with PV integrated for power quality (PQ) improvement in three phase utility systems. The main aim is to deliver the PV system's active power and reduce the current harmonics by injecting the compensation current at the point of interaction (POI). The main contributions in this work presents an optimization based approach called the predator-prey based firefly optimization (PPFO) for reducing the total harmonic distortions (THD) and, the Adaptive Perturb and Observe Fuzzy (APOF) is developed for tracking the maximum power. The effectiveness of the PPFO is tested with other methods like particle swarm optimization (PSO) and firefly optimization (FO). The proposed technique is performed using MATLAB/ Simulink tool under different supply conditions.

1. Introduction

PV integration and harmonics reduction in the modern power distribution system are challenging [1]. Nowadays, it is noticed that the major domestic and industrial loads are using various semiconductor devices. These devices cause multiple issues in the system like harmonics and unbalance current, unbalance voltage, over and under-voltage, sag/swell in voltage and so many other problems. Due to these problems, other factors like overheating the device, low power factor, large neutral current, and communication interference occur. The hybrid shunt active power filter (HSAPF) with multilevel inverter (MI) [2] configuration can compensate these power quality (PQ) issues by injecting the filter current into the power system.

Conventionally, two-level inverters are used for the low voltage section; however, MI has expanded its significance in the medium and high voltage sectors. The application of MI is widely seen in areas of customary utilities, power control and industrial use. The MI is suitable to produce large voltage output with multiple small voltage rating switches, and it also decreases the harmonics generated due to switching and hence, improves the efficiency of the system device. MI effectively compensates the current harmonics and monitors the power semiconductor switches with a frequency near the fundamental one. Looking to the other MI, the modular cascaded MI (MCMI) [3] has an

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Comparative Analysis of Fuzzy and Neural Network Based Dynamic Voltage Restorer for Power Quality Improvement

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ABSTRACT

One of the significant worries in power industry today is power quality. It turns out to be particularly significant with the presentation of cutting edge and entangled gadgets, whose exhibition is delicate to the nature of intensity supply. The electronic gadgets are touchy to unsettling influences and in this way mechanical burdens become less tolerant to control quality issues, for example, voltage plunges, voltage hangs, voltage flashes, music and burden unbalance and so on. At present, a wide scope of entirely adaptable controllers, which profit by recently accessible force hardware segments, are developing for custom force applications. Among these, D-STATCOM, dynamic voltage restorer (DVR) and brought together force quality conditioner (UPQC) which depends on the VSC rule are utilized for power quality improvement. The primary point of my paper is to plan DVR which is utilized to remunerate voltage quality issues and Fuzzy Logic Controller and Artificial Neural Network (ANN) is utilized to control the inverter. The outcomes are contrasted and ordinary controller. The outcomes will be examined utilizing matlab/simulink programming.

KEYWORDS:Dynamic Voltage Restorer, Artificial Neural Network, Fuzzy Logic Controller, PI Controller, Fuzzy Inference System, Rule View, Surface View.

1.INTRODUCTION

Power quality issues in the circulation frameworks are interference, voltage droop and voltage swell because of the expanded utilization of delicate and basic gear's in the framework. A few models are gear's of correspondence framework, process enterprises, exact assembling forms and so on. Force quality issues, for example, homeless people, droops, swells and different twists to the sinusoidal waveform of the stock voltage influence the presentation of these equipment's. A DVR is utilized to remunerate the inventory voltage unsettling influences, for example, droop and swell. The DVR is associated between the stock and touchy burdens, with the goal that it can infuse a voltage of required extent and recurrence in the conveyance feeder. The DVR is worked with the end goal that the heap voltage extent is controlled to a consistent size, while the normal genuine force retained/provided by it is zero in the relentless state. The capacitor upheld DVR is broadly tended to in the writing [8-11]. The instantaneous reactive power theory (IRPT) [6], sliding mode controller [9], instantaneous symmetrical components [2] etc., are discussed in the literature for the control of DVR. In this project a new control calculation is proposed dependent on the present mode control and relative essential (PI) controllers for the control of DVR. The broad

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Torque Ripple Minimization for Switched Reluctance Motor Using Instantaneous Torque Control Theory

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ABSTRACT

In this project design and implement a ripple low torque using torque control theory for switched reluctance motor.This project presents minimizing the torque ripples in the switched reluctance motor using IDTC method. The SRM has run by BR converter, this converter is used to give the voltage to the motor with respect to motor sensor signals. The closed loop speed control can be achieved by PI control, Fuzzy, Neuro fuzzy controller. IDTC control overcomes the existing peak to peak current control method and it provides better torque ripple reduction. The model used in the simulation is the linear magnetic model which has the 8/6 structure. The mat lab simulation results illustrate the capability of Switched Reluctance Motors (SRM) being used in the motor drive industry with minimum copper loss.

KEYWORDS: Torque, Ripple, Reluctance, Motor, Fuzzy, controller, IDTC control

1.INTRODUCTION

Switched reluctance motor (SRM) is a special type of variable reluctance motor designed for rugged operation. Being light weight, SRM has the capability of driving high torque, which makes it attractive in the fields of electric vehicle and aerospace applications. SRM has simple manufacturing process which makes it cheaper as compared to other motors. SRM is fault tolerant, reliable, and have high power density. The Switched Reluctance Motor is an old member of the electric machine family. SRM, especially for use inservo-type applications, but its having high torque ripple .The torque ripple is a consequence of the nonlinear torque-current-angle (T-i-0) characteristics of SRM and the discrete nature of torque production. The existence of the torque ripple leads to the generation of annoying noise and undesired vibration during the operation, the torque ripple can be reduced by improving the magnetic design of the motor [1].A modified torque sharing function based on the change of the overlap angle during the commutation process depending on the motor speed is presented [2].Torque ripple minimization can be achieved through machine magnetic design or through electronic control [3].It is very important problem to determine randomly the neural parameters initially and then the parameters are adjusted to optimize the torque error [4].An improved asymmetric half bridge converter (AHBC) to enhance the output performance of a segmented-stator hybrid-excitation switched reluctance motor (SSHE-SRM) driveConverter circuit is expensive [5].SRM drive is fed with a simple diode bridge rectifier (DBR) followed by a bulky capacitor, which draws peaky

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DFIG Based Grid Connected Wind Energy Conversion System for Power Quality Improvement

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ABSTRACT

In this project design and implementation of DIFG based grid connected wind energy for improving the power quality system. This proposes grid voltage stability using Fuzzy logic controller in Wind energy conversion systems. The D-Q theory + Fuzzy logic controller is used to generate reference voltage and current from source and load voltage current for harmonics mitigation. To maintain constant DC link voltage control using dq+ Fuzzy logic controller. To compensate the reactive power with D-Q theory. The obtained results indicate that the proposed approach maintains sustainable environment with enhanced efficiency and minimal harmonics. The entire system is validated through a MATLAB simulation.

Keywords: wind energy, D-Q theory, DC link voltage, fuzzy logic controller, power quality.

1.INTRODUCTION

As the wind power generation continue to flourish worldwide, the power system will inevitably confront multiple challenges with regards to their high-level of penetration. Therefore, wind energy conversion systems (WECSs) must quickly take interest in ancillary services. For instance, the need for participating in frequency regulation become greater with an important penetration rate of wind turbines. A significant wind production will lead to the shutdown of many traditional power generators, which will reduce the primary frequency regulation reserves needed to be maintained in order to ensure the reliability and the stability of the electrical grid Environmental concerns with regards to the use of traditional power plants, the ever-increasing energy consumption

Wind energy conversion systems has emerged as one of the most viable and economical options and has experienced a significant growth recently. Among many other wind energy conversion technologies, there has been a massive amount of activities on the DFIG-based wind turbine due to the different advantages that is brings compared to other alternatives. It is basically a wound rotor induction machine, with stator winding directly connected to the grid, and rotor winding are connected through back-to-back converter that consists of, the generator side converter (DSC) and the grid side converter (GSC) separated by a DC-bus capacitor. Owing to its high-energy efficiency, lower mechanical stress, reasonable power converters that carries only the third of the rated power (reduced losses and cost), separately controllable active and reactive power and a variable speed operation that allows the system to extract the maximum power from the wind over a wider range, the DFIG gain its popularity. Sliding mode control (SMC) based on a linear matrix inequality (LMI) is proposed to

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PV Integrated Battery System for Power Balance using ANN Technique

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ABSTRACT

Battery storage is usually employed in Photovoltaic (PV) system to mitigate the power fluctuations due to the characteristics of PV panels and solar irradiance. Control schemes for PV-battery systems must be able to stabilize the bus voltages as well as to control the power flows flexibly. This paper proposes a comprehensive control and power management system (CAPMS) for PV-battery-based hybrid micro grids with both AC and DC buses, for both grid-connected and islanded modes. The proposed work compares PI controller with Artificial neural networks (ANN). The power balance and ripples are regulated. The work was carried out using Matlab simulink software.

KEYWORDS: Battery storage, Artificial Neural Network, PV-battery systems, PI Controller.

INTRODUCTION

A microgrid is a group of interconnected loads and distributed energy resources within clearlydefined electrical boundaries that acts as a single controllable entity with respect to the grid. Amicrogrid can connect and disconnect from the grid to enable it to operate in both grid-connected or island-mode.

To meet the electricity demands of its users, a microgrid must have a generation source. Giventhat microgrids are an older concept, the electricity supplied to microgrids has historically been from "behind the meter"fossilfuelgeneratorsgas-poweredgenerators,forexample.However, with the falling cost of solar, not to mention the environmental benefits of switchingfrom fossil fuel generation to solar power, many of the microgrids being designed today supply electricity with a combination of solar plus battery storage.

First, this is a form of local energy, meaning it creates energy for nearby customers.Thisdistinguishes microgrids from the kind of large centralized grids that have provided most of ourelectricity for the last century. Central grids push electricity from power plants over longdistances via transmission and distribution lines. Delivering power from afar is inefficientbecause some of the electricity – as much as eight to fifteen percent– dissipates in transit. A microgrid overcomes this in efficiency by generating power closeto thoseit serves the generators are near or within the building, or in the case of solar panels, on the roof.

2. SOLAR ENERGY

A.Introduction

Solar cell is one way of producing electricity that includes converting solar radiation into direct current electricity using photovoltaic semiconductors. Solar panels with a number of cells containing a photovoltaic material are used in photovoltaic power generation. Monocrystalline silicon, polycrystalline silicon, amorphous silicon, cadmium telluride, and copper indium selenide/sulfide are currently employed in photovoltaic's [1]. Solar cell

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Design and Analysis of High Gain Interleaved DC-DC Converter for Solar Powered Sensorless BLDC Pump

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ABSTRACT

This project proposes Sensor less control based Permanent magnet Brushless DC Motor for pump applications. The proposed MPPT (Artificial Neural Network) algorithm one offers improved reliability and tracks maximum power from the solar panel. Back EMF detection scheme is used for Sensor less control and V/F method is used for starting the BLDC motor. The voltage source inverter (VSI) is used to perform electronic commutation of the BLDC motor which is operated with the pulses of fundamental frequency, avoiding switching losses caused by the high frequency switching pulses. Furthermore, the speed of BLDC motor is controlled through the variable DC link voltage. Closed loop speed control algorithm is achieved by using Fuzzy controller and it is implemented in MATLAB simulation.

KEYWORD: Artificial Neural Network, BLDC motor, Fuzzy controller, EMF detection

1.INTRODUCTION

The induction motors are widely used to drive a water pump due to its robustness, low cost, ability to operate in hazardous and contaminated areas, availability in local markets, and lower maintenance cost [1]. Some of the limitations of the induction motor are not favorable for SPV array based water pumping such as requirement of complex control and prone to overheating if the voltage is too low [2]. In the last decade, brushless DC (BLDC) motors have begun to replace induction motors for small scale pumping applications [3] due to its higher efficiency as compared to an induction motor, long life, high reliability, low radio frequency interference and noise and no maintenance [4-5], hence adapted in this work. The BLDC motor used in SPV array based applications so far requires additional control circuitry and sensors to facilitate the speed control, resulting in the increased complexity, cost, weight and size of the system [6]. Moreover, the voltage source inverter (VSI), feeding the BLDC motor is operated with the high frequency PWM pulses, resulting in an increased switching losses. In this work, speed of the BLDC motor is controlled through the variable DC link voltage, hence no additional sensors are required for speed control. Furthermore, the VSI is operated, by electronic commutation, with the pulses of fundamental frequency, which minimizes the switching losses. The power optimization or so called maximum power point tracking (MPPT) is mandatory for efficient utilization of SPV array. The numerous literature is available on MPPT techniques [7]. A DC-DC converter, as an intermediate power conditioning unit, is commonly used between the SPV array and the VSI to perform MPPT. The rate of adoption of solar photovoltaic (PV) based power generation by the industries and instant consumers is being increased owing to a rapid reduction in the cost of PV modules. In addition, fossil fuel

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D. RaviKishore ; B. Kavya Santhoshi ; K. Sravani ; Kalpaguri Maruthi **All Authors**

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As the number of distributed power systems that use non-linear loads has increased, improving power quality has become a top priority for academics. In this work, we look at how the harmonics in a distributed power system may be reduced with the use of a device called a Distribution Static Synchronous Compensator (D-STATCOM). When compared to other FACTS devices, D- STATCOM has more reliable voltage stability because to its built-in voltage regulator. As a result of its high voltage-gain ratio, LUO converter is employed. Using an ANFIS -based MPPT (Maximum Power Point Tracking) guarantees regulated output and facilitates the extraction of maximum power from the PV panel. The DFIG-based WECS utilises a PWM rectifier, which is in turn controlled by a PI controller, to complete the AC-DC conversion. Reference current generation is essential for harmonic removal, and this is achieved by the Hysteresis Current Controller. MATLAB is used to simulate the complete regulated process, and the results show that the suggested method provides higher power quality with less distortion than other methods.

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Rapid exhaustion of fossil fuel energy systems, emission of carbon, and climate change issues has been paid more attention in the recent scenario. The development of power electronic devices, the growth of industries and population increases the need for green energy. The Hybrid renewable energy of wind and PV system are the better choice due to the benefits of the reliability of power based on the weather condition, an extension of the grid system, and remote electrification. In this research, the isolated grid integrated multilevel inverter for hybrid (Solar and wind) battery-based fly back converter application is proposed with optimal controlling techniques. The primary objective of this research is to design and develop the fly back converter with an effective controller to obtain the higher power output during the operation of continuous and discontinuous conduction mode respectively. Even though, the researchers are mostly implemented with Cascaded H-Bridge (CHB) inverter-based grid-tied system. CHB are increasing the harmonics, the requirement of the filter circuit and overall efficiency. To solve these issues thirty-one level inverter is proposed by considering intelligent techniques as a secondary objective. The modeling and controlling techniques of the discussing system are done by MATLAB tool. The prototype setup provides the experimental feasibility of the developed hybrid PV-wind connected fly back converter with a thirty-one-level inverter-based grid-tied system by considering the reliability of intelligent controller system.

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The development of a microgrid for an electric vehicle charging station that makes use of a variety of renewable energy sources is the major objective of this project (utility grid, solar PV plant, wind energy system). In this instance, the solar array is anticipated to produce 15 kWp, while the wind turbines are anticipated to produce 5 kWp. A distributed energy system's efficiency and performance may be significantly improved by the use of a dc-dc converter and the perturb and observe method of maximum power point tracking (mppt). Both of these techniques are part of the maximum power point tracking (mppt) protocol. The configuration that has been proposed is helpful for constructing a locally characterized microgrid that is not only functional but also cost-effective. This is a novel component that has been included to this research since it would reduce the need for the electric grid during peak demand periods, which is a significant challenge faced by contemporary megacities.

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As a result of climate change, renewable energy sources like solar and wind have become the most popular choice for distributed generators (DGs). Power sources including wind, solar, biomass, mini-hydro, fuel cells, and microturbines will help boost decentralised power production. Electricity systems may benefit from distributed generation in a number of ways, including environmental friendliness, scalability, and the use of nonconventional microsources. A regulated microgrid is comprised of loads and distributed generators. Microgrids may function whether or not they are connected to the main power grid. Microgrids provide power system connections to variable renewable AC and DC sources and loads while minimising the need for reverse conversions in AC or DC grids. Connecting DGs to the utility/grid through power electronic converters raises questions about the security and integrity of the connected systems. Local dependability, feeder loss reduction, local voltage support, waste heat utilisation, voltage sag correction, and uninterruptible power supply are just some of the client demands that may be met by tailoring the microgrid to their specific requirements. In order to better understand how hybrid AC/DC microgrid systems function when connected to the mains, this research evaluates their efficiency. Microgrids use renewable energy sources such as solar panels, wind turbines, and batteries. The DC and AC sub-grids are synchronised by the manipulation of converters. MATLAB/Simulink is responsible for generating the results.

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Metadata

Abstract:
As a result of climate change, renewable energy sources like solar and wind have become the most popular choice for distributed generators (DGs). Power sources including wind, solar, biomass, mini-hydro, fuel cells, and microturbines will help boost decentralised power production. Electricity systems may benefit from distributed generation in a number of ways, including environmental friendliness, scalability, and the use of nonconventional microsources. A regulated microgrid is comprised of loads and distributed generators. Microgrids may function whether or not they are connected to the main power grid. Microgrids provide power system connections to variable renewable AC and DC sources and loads while minimising the need for reverse conversions in AC or DC grids. Connecting DGs to the utility/grid through power electronic converters raises questions about the security and integrity of the connected systems. Local dependability, feeder loss reduction, local voltage support, waste heat utilisation, voltage sag correction, and uninterruptible power supply are just some of the client demands that may be met by tailoring the microgrid to their specific requirements. In order to better understand how hybrid AC/DC microgrid systems function when connected to the mains, this research evaluates their efficiency. Microgrids use renewable energy sources such as solar panels, wind turbines, and batteries. The DC and AC sub-grids are synchronised by the manipulation of converters. MATLAB/Simulink is responsible for generating the results.

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FOUR WHEEL STEERING MECHANISM USING WIRELESS JOYSTICK CONTROL SYSTEM

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ABSTRACT

The front-to-rear wheel alignment plays a significant role in the directional stability of a vehicle. Often the lack of stability causes a dangerous drive. This is clearly observed when a car has worn suspension bushes.

Fourwheel steering is a method developed in automobile industry for the effective turning of the vehicle and to increase the maneuverability. In a typical front wheel steering system, the rear wheels do not turn in the direction of the curve and thus curb on the efficiency of the steering. In four wheels steering the rear wheels turn with the front wheels thus increasing the efficiency of the vehicle. The direction of steering the rear wheels relative to the front wheels depends on the operating conditions.

In standard 2 Wheel Steering System, the rear set of wheels are always directed forward and do not play an active role in controlling the steering. While in 4 Wheel

Steering System, the rear wheels do play an active role for steering, which can be guided at high as well as low speeds. Also in situations like low speed cornering, vehicle parking and driving in city conditions with heavy traffic in tight spaces, driving would be very difficult due to a sedan's larger wheelbase and track width.

INTRODUCTION ;

Four wheel steering is a method developed in auomobile industry for the effective turning of the vehicle and to increase the maneuverability. In a typical front wheel steering system the rear wheels do not turn in the direction of the curve and thus curb on the efficiency of the steering. In four wheels steering the rear wheels turn with the front wheels thus increasing the efficiency of the vehicle. The direction of steering the rear wheels relative to the front wheels depends on the operating conditions.

Nowadays, the problem of increased road traffic has made the handling of vehicles even difficult. Thereby there is a need to find an alternative mechanism for easy steering (turning) of the vehicles. At times when a vehicle is in a congested or a narrow area everyone would want to have a better turning response from the vehicle or want the vehicle to move side wards without much or without any forward movement. Here comes the application of a Four wheel steered vehicle. It should not be mistaken to a four wheel drive in which all four wheels of a vehicle are powered. Here, the rear wheels are also bought into action as they are made to engage their movement in accordance to the front wheels in the directions required.

DESIGN AND FABRICATION OF MULTIPURPOSE SOLAR OPERATED KISAN MACHINE

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Abstract: Farmers are the back-bone for every country. Present days ,rapid growth of population has been observed along with that ,requirement of food also increasing as it the necessary to survive, but interest towards farming is reduced among the people due to cost of labour, heavy rate of work, health issues while spraying the fertilizers and chemicals to the crop. So, in order to demolish these problems a flexible sprayer is required which consists of two major motions reciprocator and rotary motions. The range of the spraying can be adjusted with the help of regulator and the aim of the project is to develop a flexible sprayer and to reduce the problems faced by farmer while spraying the fertilizers and chemicals.

In this proposed system, we have designed a IoT based Solar operated Kisan The aim of this project work is to develop and modernized process for spraying system; hence it is widely used in all farms because it is easy to use and operate.

Keywords – **Fertilizers, Flexible Spraying system. Microcontroller, Node MCU, Motor driver, Pump.**

I.INTRODU CTION:

The applications of pesticides using spraying equipment are play an important role. The chemicals are widely used for increasing agricultural production through better insect and pest management. Spraying is one of the most effective and efficient technique for applying small quantity of liquid1through fine droplets to protect the crops. In India, many versions of hand operated and power operated spraying equipment's are being used. At present, the farmers generally using all kinds of manually operated knapsack sprayer which can cover 0.4 ha/hr and motorized sprayer can cover 1.2-1.6 ha/hr for spraying of pesticides on crops like cotton, red gram. Farmers are facing the problem of coverage of large area within a short period of time as the pest attack is serious problem and spreads quickly.

In the market, different versions of tractor operated or bullock operated sprayers are available, many of the farmers generally spray 6-8 times in a season using manually operated or motorized sprayer to cover large area within a short period of time. Modern spraying technique will improve the operators comfort, safety and spraying effectiveness which would go a long way in increasing crop yield.

Generally the power required for spraying is met out from either alone or combination of human source and mechanical power viz., either petrol engine or dual fuel engines for operating the pump. Sometimes the batteries are used for running the motor which operates the pump for discharging the chemicals. But these batteries require electricity for charging them. However, due to rapid rise in the price of fossil fuels and their limited availability, there is now greater awareness of the need for development of renewable energy gadgets, which is the need of the hour. Because of inadequate supply of electricity, there is a frequent power cut and this situation is shill worse in the rural areas. Hence, there is a greater scope for utilization of solar energy for generation of electricity using solar photovoltaic cells and further to utilize the same for spraying, water pumping, lighting etc.

In this project Blynk app is used to control the movements of the bot. Blynk is a Platform with iOS and Android apps to control Microcontroller, Arduino, Raspberry Pi and the likes over the Internet. It's a digital dashboard where you can build a graphic interface for your project by simply dragging and dropping widgets. It's really simple to set everything up and you'll start tinkering in less than 5 mins.

Blynk it is a supporting application of hardware components to work on the internet base by using the node mcu 8266, relay and other iot based things to work as per our requirement.

DESIGN AND IMPLEMENTATION OF LINE FOLLOWING AUTONOMOUS DELIVERY ROBOT

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Abstract : Automated Guided Vehicles are semi-autonomous Robot capable of navigating and deliver goods in the predefined path without human intervention. The Line follower robot's path can be either visible like a black line on a white surface or it can be invisible like a magnetic tape, laser targeted, vision guidance geo-guidance. The robot uses an array of IR-sensors to navigate through the path. After that, the data is transmitted to the Arduino Uno for processing and making the decision accordingly. An ultrasonic sensor is being used to avoid the collision if any object or human comes in the vicinity of the robot.

Index Terms **- Automated guided vehicles (AGV), Magnetic tape, Infrared Ray Sensor, Ultrasonic Sensor**

I. INTRODUCTION

A robot is reprogrammable multi-functional manipulator designed to place goods, parts, tools or specialized device through variable programmed motions for the performance of task. (Robot institute of America) [1]. Automated guided Robots are nothing new to the world of robotics and they have a wide spectrum of the scope of usage in various fields Like material handling robots used in warehouses, Work-in-process movement, Trailer loading, Theme parks, Pharmaceutical, hospitals to automatically deliver medicines to patients at the due time. An AGV can also be called a laser guided vehicle (LGV). In Germany, the technology is also called Fahrerlose Transport system (FTS). AGVs are available in a variety of models and can be used to move products on an assembly line, transport goods throughout a plant or warehouse, and deliver loads [2]. This paper explains about designing and implementing of a line following robot using guided tape method to navigate throughout the college premises to deliver notices and attendances register to different classes autonomous. To avoid collision with humans being and objects an ultrasonic sensor has been used. For better traction and stability 4-wheel drive architecture has been used. Circulating notice throughout the college is a monotonous time taking job for which using such Robot can be used.

II. PARTS AND MODULES

2.1 Arduino Uno

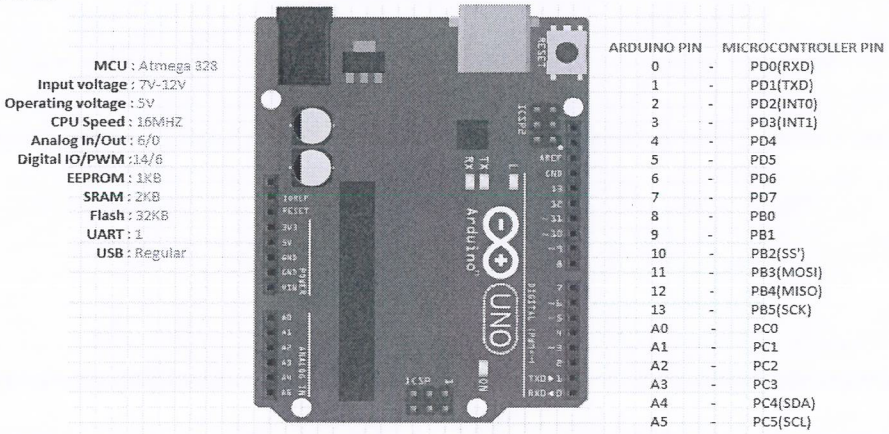

Fig2.1: Arduino Uno R3

It is a single board microcontroller containing ATMEGA328P microchip. It is widely used for making ROBOT prototypes. Coding and interfacing with Arduino are very easy and convenient. The main advantage of using Arduino is, it's completely open sourced each and every detail is provided in datasheet in their official website which makes it easy to customize according to need. Specification and pin diagram are shown in fig 2.1.

PERFORMANCE ANALYSIS & EMISSIONS INVESTIGATION OF DEAD PLASTIC DERIVED OIL BLENDED WITH CRUDE OIL EXTRACTED DIESEL

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Abstract: In recent days the major problem faced in our country is the depleting quantity of conventional fuel, even the quantity of petroleum and crude oil has been utilized more, but there is a lesser production. Due to the increasing utilization of petrol and diesel has paved the way to think people for some alternative way of energy resources. Increase in plastic waste plays a major rising problem against the people of the world. Now current work focused about an issues and efforts are made to get optimum solution. By this dead plastic waste has been converted into plastic pyrolysis oil through pyrolysis process. Dead Plastic oil blended with diesel and it has been used in single cylinder, 4- stroke Variable Compression Ratio engine. Through blending process there is a reduction in the consumption of diesel fuel. The change in the blending ratio of dead plastic oil and diesel fuel has a direct impact on the engine performance as well as exhaust emission data. To understand the change in engine performance, different blends of dead plastic oil and diesel fuel were prepared and test were conducted by running these blends separately in VCR engine with various loads at compression ratios 16 and 17. Blends were prepared for 10%, 20%, 30%, 40% of Dead plastic oil with 90%, 80%, 70%, 60% diesel fuel respectively. Through graphical representation of different performance parameters the effect of engine performance of each blend were compared with diesel fuel.

Index Terms - **Dead plastic oil, Diesel fuel, Blend proportion, Compression ratio, performance, VCR engine**

I INTRODUCTION

With time passing by, the fossil fuel reserves are depleting at a faster rate, causing continuous increase in price of petroleum products all over the world. The high price of petroleum products is a big concern for Indian economy. India imports on an average 80% of total demand of crude oil. It is one of the main reasons of GDP expense. Therefore an alternative cheaper fuel is required to fulfill the needs of common man. Alternative source of fuel lies in plastic. In India 56 lakh tones of plastics are generated each year and only 60% of it is recycled. Safe method of disposing dead plastic has not yet been implemented here, and dumping of dead plastic underground is hazardous to the environment. But we can use it as an alternative source of fuel for gasoline and diesel. This will save the environment from hazardous effect as well as to boosting the Indian economy. In this project we investigated the potential use of Fuel extracted from dead plastic as biodiesel. Various experiments were conducted on Fuel extracted from dead plastic with various blends (P10, P20, P30 and P40) on Variable Compression Ratio (VCR) diesel engine with compression ratio 16 and 17. The results were recorded and compared with the conventional diesel fuel.

II LITERATURE REVIEW

This chapter reviews some of the previous work related to this research work in order to provide background for the subsequent chapters. This main objective is to provide an overview of past and ongoing scientific investigations and modelling related to plastic fuel used in internal combustion engines.

M Ruban, et al studied the properties of the waste plastic fuel is analyzed and compared with the fossil fuel diesel and found that almost it has similar properties to the diesel. The characteristics of the waste plastic fuel is obtained from various studied and summary of the results are the higher heat release rate in waste plastic oil compared with diesel fuel due to better combustion. The Nox increase 40% due to higher heat release rate and combustion and temperature. The CO emission increased 7% in waste plastic oil compared to diesel operation. Unburned hydrocarbon emission is higher by about 15%. Waste plastic fuel exhibits higher thermal efficiency up to 75%. Activated carbon using with this experiment fuel is clean and color is bright yellow. This fuel burns cleaner and burning time is also longer.

Based on the literature survey, it is observed that it is possible to convert waste plastic into liquid waste plastic oil (WPO). But no attempt has been made to use dead plastic oil as a complete alternate fuel in a VCR diesel engine under various operating conditions for its suitability as a fuel in a CI engine. A prototype setup was fabricated and the oil was obtained for the experimentation. The present work focuses on using DWPO as alternative fuel in a variable compression ratio diesel engine in the form of a blend and as a neat fuel at different load conditions.

PRODUCTION OF BIOGAS THROUGH SMART WASTE MANAGEMENT BY CHEMICAL DIGESTERS

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Abstract: The conversion of kitchen waste into naturel energy by adding some chemical digesters. In kitchen waste the organic material of high nutritive and calorific values, the composting or other reuse of bio-degradable waste such as food or garden waste is also considered for recycling. Keep the kitchen waste in, crush containers, and recycle.The digestion of the kitchen waste produces biogas, anaerobic digestion is a microbial process for production of biogas, and Biogas consists of gases like methane and carbon dioxide. And With the help of bio-gas we produce heat and electricity and it can be used as fuel. Biogas can be produced from raw material such as agricultural waste, manure, municipal waste, plant material, sewage, green waste or food source. It can also be used in a gas engine to convert the energy in the gas into electricity and heat. This process is economically cheaper.

Index Terms - **Anaerobic digestion; Biogas; chemical digester; kitchen waste**

I. INTRODUCTION

In our college of engineering there are two individual canteens and both having their own individual mess, our project is to create a biogas which will be eco-friendly, more cost effective. Daily large amount of kitchen waste is obtained from our mess, it can be utilised for better purpose of producing biogas, Biogas can be used as high quality renewable fuel, by placing a biogas reactor on campus, and it will be beneficial. Kitchen waste will be collected from individual messes for the reactor to produce biogas energy. The digestion of the kitchen waste produces biogas, anaerobic digestion is a microbial process for production of biogas, Biogas consists of gases like methane and carbon dioxide, and it can be used as energy source. In kitchen waste the organic material consist of high nutritive value and high calorific value, so the efficiency of methane is high. So the cost of the biogas production is low.

In our country deforestation and pollution was very big problem, most of the people uses charcoal and wood as fuel or to produce energy. It leads to deforestation, it also damages soil erosion, dung and fire wood also leads to pollution by producing smoke, Coal and petrol are also used to produce energy, but they are non-renewable and damages the environment, Renewable energy sources like solar energy, wind energy, thermal energy, hydro source and biogas are all renewable energy resources.

In most cities and places, Kitchen waste is disposed in landfills or discorded which causes the health hazards and diseases like malaria, typhoid. It not only leads to polluting surface and ground water, it further leads to breeding of flies and mosquitoes, rats and other diseases. From this it emits bad smell and methane. It is a major greenhouse gas.

By using cattle dung, municipal solid waste (MSW) or sewage in biogas plants, we can make this system very efficient by using kitchen waste or food waste. Biogas has different characteristics, at the same time organic waste can be used as fertilizer and water for use in Agriculture irrigation. It does not require any advance technology to produce energy, it is very simple to use. We need eco-friendly energy.

1. BIOGAS

BIOGAS: Biogas is a renewable source, like wind energy, solar energy, thermal energy, hydro energy. It is eco-friendly and clean. It is used to produce lighting, heating and generation of electricity and also used as fuel for cooking. Biogas is formed under the condition of anaerobic, this process is known as anaerobic digestion, and the digester would produce fertilizer and methane, biogas consist of some gases like methane (CH4), carbon dioxide (CO2), water (H2O), hydrogen sulphide (H2S), ammonia, nitrogen, oxygen, hydrogen. Biogas can be formed by using the cow manure, buffalo manure, pig manure, kitchen waste, municipal waste, agriculture waste. Biogas is produced under the absence of oxygen.

DESIGN AND FABRICATION OF TRUCK BED ATTACHED WITH CONVEYOR BELT

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Abstract: Conveyor Belts are used for loading and unloading. The systems are designed to move large family of material transport equipment over fixed path. In these project we will design and fabrication of a cargo bed which is the back part of the truck where are the goods are placed. The base part of the cargo bed is made of a conveyor belt where the load will bear. The design of cargo bed will in v-shape so that the load concentration over the conveyor belt will be reduced when compared with u-shaped cargo bed. For the operating of conveyor belts we use low speed and high torque DC Motor. The goods will unload from the truck by using conveyor belts.

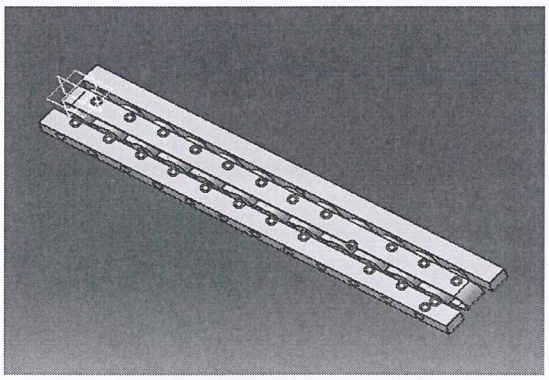
Index Terms **– conveyor belt, cargo bed, concentration, DC motor.**

I. INTRODUCTION

Conveyor is used in many industries to transport goods and materials between stages of a process. Using conveyor systems is a good way to reduce the risks of musculoskeletal injury in tasks or processes that involve manual handling, as they reduce the need for repetitive lifting and carrying. Conveyors are a powerful material handling tool. They offer the opportunity to boost productivity, reduce product handling and damage, and minimize labour required in a manufacturing or distribution facility. All lifting and conveying machines can be divided by their operating principles into two large groups: (i) Intermittent motion, (ii) Continuous motion Intermittent motion includes all types of cranes, lifts; surface transport means (trucks, loaders, prime movers), aerial tramways and cable ways, scrappers and the like. Continuous motion includes conveyors, pneumatic and hydraulic transport means etc. which may generally called continuous transport machines or conveying machines. Continuous machines are characterized by non-stop motion of bulk or unit loads along a given path, without halts for loading and unloading. At the same time they can distribute loads among a number of destination points, deliver them to stores, and transfer products from one technological operation to another and ensure the desired pace of a production process.

II. WORKING

This project is based on rubber conveyor belt. As the pulley moves belt starts to rotate in forward direction. Idlers help in maintaining close contact with the pulley. Material is collected mechanically or manually at other end. Belt then returns again at the point of feeding. Conveyor belts are basically very wide belts attached in a loop to two or more turning rotors driven by motors. The loop is the actual conveyor belt, and is generally made of two or more layers of rubber, one layer to give shape and structure to the belt and one to allow it to transport its load safely. This conveyor loop is generally attached to two wheels, called rotors, which are spun by motors. The conveyor belt has enough friction between it and the rotor that it sticks to this rotor. As a rotor turns, the conveyor belt will turn as well due to the intense friction between the rotor wheel and the belt. This turning motion of the rotor causes one side of the belt to move in one direction, while the other moves in the opposite direction. This means that both wheels must always be moving in relatively the same direction, either clockwise or counter-clockwise. If the two rotor wheels moved in opposite directions, the conveyor belt would not travel at all.



2.1 Working of conveyor belt

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ROOM TEMPERATURE REDUCING ECO COOLER MADE FROM WASTE PLASTIC BOTTLES

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Abstract

Summer is in full swing and many of us are complaining about the heat. But few places reach the scorching temperatures where air conditioning is simply not an option for most people living in rural areas. A clever DIY cooling system that does not require electricity is built from common waste items such as empty plastic bottles. We call it a eco cooling system. The working is based on the principle that when the compressed air expands through the nozzle, the swirl motion is created. The air moves as a free vortex from the nozzle plane towards the valve end. As it reaches near the valve, the kinetic energy is converted into the pressure energy giving a point of stagnation.

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Keywords and phrases: development of artificial cooler, waste bottles, unused cardboard, eco cooler.

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FREE VIBRATION ANALYSIS OF SIMPLY SUPPORTED CIRCULAR COMPOSITE PLATE

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Abstract: Structural components now-a-days are made of the Composites so knowing the fundamental frequencies and vibration response to various excitations for a given boundary function is paramount. The present work involves extensive study to investigate the free vibration analysis of Graphite/Epoxy, Glass/Epoxy & Kevlar/Epoxy composite plates of solid circular form in simply supported boundary condition by using the Bessel functions as admissible functions for the Raleigh-Ritz method. This analytical work is carried out by following the thin plate theory, Hamilton principle is used to obtain the equilibrium equations for the plate. By variable separable Bessel transcendental equations are obtained, the non dimensional frequency parameter, natural frequency of the plate is calculated. Thus, the natural frequencies and its associated mode shapes of the given geometry under proposed boundary condition is obtained. It is observed that the natural frequencies and modes of vibration for graphite/epoxy shows better improvement during first mode under simply supported boundary condition. It is recommended that the graphite/epoxy is best suitable material for dynamic structural applications.

***Index Terms* – composite plate, Natural frequency, Bessel function**

I. INTRODUCTION

Vibration analysis and Composite materials are the two growing research topics. Almost all the structural components subjected to the dynamic loading in their working life cycle and the vibration affects the life of the structure. So it is paramount in designing a structure to know the vibrational response so that necessary preventive steps to control its structural vibrations. Mohammad Amin Rashidifar, Ali Amin Rashidifar [1] has investigated analytically Free and Forced Vibration response for isotropic material of clamped circular geometric plate by using the Bessel functions and Henkel Transformations. Leissa [6] a technical report on plate vibration by Leissa includes the analytical solutions of plates of various shapes. The analytical values of the non dimensionalized frequency parameters for different shapes and boundary conditions were given, based on this report, many other researchers have approached more difficult versions of plate vibration problem. Her, Liu and Lin [3], [4], [5]Parikshit Mehta [8] He investigated analytically free and forced vibration response for aluminum clamped circular geometric plate and membranes by utilizing the Bessel functions. An equilibrium analytical solution is derived using the Hamilton principle and non dimensionalized frequency parameter, natural frequency, deflection of the circular plate is carried out.

II. FREE VIBRATION ANALYSIS OF CIRCULAR COMPOSITE PLATE

Governing equation of motion for the composite circular plate is given in eq. (1)

$$\rho h \frac{\partial^2 w(r,\theta,t)}{\partial t^2} + D_e \nabla^4 w(r,\theta,t) = 0 \tag{1}$$

The differential equations for spatial and temporal variables eq. (2) and eq. (3) is obtained as follows

$$\frac{\partial^2 T}{\partial t^2} + \omega^2 T = 0 \tag{2}$$

$$\nabla^4 w(r,\theta) - \lambda^4 w(r,\theta) = 0 \tag{3}$$

Where,

$$\lambda^4 = \frac{\rho h \omega^2}{D_e} = \frac{\rho h \omega^2}{\left[16\pi^4 D_{12} + 8\pi^2 H_{12} + D_{22}\right]} \tag{4}$$

D_e = Effective bending stiffness

DESIGN AND FABRICATION OF AUTOMATIC AND MANUAL COCONUT DEHUSKING MACHINE

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Abstract: *In coastal areas of India is cultivated and that to coconuts are planted more. The coconuts are dehusked by traditional ways. The coconut husk is used as the coir in Industry, Copra is supposed to eat as food; water is used to drink which contains nutrition. To dehusk the coconuts will take more time by using machete or spine. Then after those dehusking machines which runs by electric motor are invented to dehusk more coconuts. But the spines on the machine will be harmful to hands or any other parts. To overcome the above problems we designed a manual and automatic coconut dehusking machine In this we are using two hollow shaft rollers with spines on them in zigzag way .To avoid the skipping of coconut we are using fixed arm with movable enclosure . The coconut dehusking machine can be operated by rotating the handle which is connected to one of the roller and or it can be operated by using the electric motor by rotating the rollers by means of belt drives.*

Keywords **– Coconut,Dehusking, Spines, Husk, Cylinder, Enclosure.**

1.INTRODU CTION

In many coastal areas the coconuts are the mostly grown fruit. This coconut fruit is used for so many purposes. In Industries the husk is used for making the ropes, door mats, and handicraft. The husk can also be used for the cultivation of mushrooms. The copra of coconut is used in some food industries in making edible oil, mineral oil. The main concept of this project lies in removal of the coconut husk without any obstruction in removing the husk and also without any harmfulness to the operator. Its concept is very simple that is holding and removing. The coconut is placed between the two rollers which have the spikes on their periphery. The encloser will be lowered to avoid the skipping of the coconut from the roller. Then the electric motor drives the roller by means of belt drives which is connected to the pulleys. The two rollers will rotate at different speed that tends to removal of the husk from the coconut fruit

2.LITERATURE REVIEW

H Azmi et.al[1] studied briefly on the need and importance or usefulness of coconut dehusking machine in agricultural based industries. They show the relevance of the fabrication of the dehusking machine in both small scale and large scale industries.Dinanath et.al[2]has been developed the coconut dehusker. The machine is designed to dehusk the husk from the coconut fruit including a plurality of rollers rotating in opposite direction at different speeds. The interaction of the rollers in combination with the gripping of the spike.The spike serves to tear away the husk from the nut in fact Gutte[3]studied briefly on the performance of manually operated coconut dehusker has been developed by Dr.BSKKR.Depoli.It was reported that the capacity of dehusker for dehusking the coconut was 48 coconut per hour. The time requires dehusking a single coconut as 45.24sec.it requires 4 strokes to dehusk the coconut totally. Gajakos et al.[4] has developed a power operated coconut dehusker. It consists of main parts like frame, electric motor speed reduction units and dehusking units. The dehusking units consist of two cylinder viz. dehusking cylinder and idle cylinder. Dehusking cylinder was provided with triangular shape teeth on their periphery,Which on the cylinder penetrated into the husk and pulled ot away from the coconut. Single person was required for operating the dehusker. Kwangwaropas et,al[5]has been improved hydraulically operated coconut dehusking machine. It consists of three main parts such as the frame, the power unit together with hydraulic system, and dehusking mechanism. Two persons were required to work synchronously. One to operate the machine while the other to take out minor remaining fibrous husk from the shell of the dehusked coconut and collects them. Jarimopas et al.[6] has studied physical characteristics of intact and trimmed young coconuts fruits. Number of freshly available coconut fully mature fruit of the, Namhom variety were obtained. Thirty intact and 30 trimmed coconut fruit were randomly selected from three big fruit markets in the Bangkok metropolitan area. The diameter D and height H of each intact fruit were measured using vernier calipers. The physical characteristics of each trimmed fruit sample fruit height h1, shoulder height h2, shoulder diameter ds, base diameter db were measured.

Hamid et al[7]has studied the performance of developed coconut dehusker machine. The machine requires only one operator to feed the coconut into the machine. Hundreds of coconuts from four different types has been tested in the mechanical coconut dehusking machine. The performance of machine in terms of reliability, durability, unconditionality, safety, work rate, cost and efficiency were studied. The efficiency of the machine was tested for four local coconut varieties viz. Malayan tall 92.5 % and 85% for ripened and matured nut respectively, Matag 85%, Mawa 77%, and Yellow dwaft 46%. The machine was capable to dehusks 270-300 nuts/hr or 7-10 sec/nut. The dehusker machine was also found stable, reliable, and durable less maintenance, technically feasible and economically viable. Terdwongworakul et al.[8]has studied the physical properties of freshly available young Thai coconut for maturity sorting. Judging the maturity of young coconut was difficult and thus the harvested crop typically featured fruit of varying levels of maturity, which currently require was manual grading. In an attempt to help reduce the time and costs associated with the grading process, the correlations between the physical, mechanical, physiological and acoustic properties of coconuts and their maturity levels were investigated. Jacob and Kumar et al. [9]has been designed power operated

FABRICATION AND STUDY OF MECHANICAL PROPERTIES OF COMPOSITE NATURAL FIBER

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Abstract : Natural fibers (Sisal, Jute, Banana, Coir) in combination with Epoxy resin has proved to be excellent for making cost effective composite materials. To have the genuine results , the retting process of each fiber has been done by ourselves to obtain the pure form of fibers. Each fiber is sorted to have equal length and assembled properly. They are prepared using pultrusion method. A bunch of fibers are forcibly extruded through the tube and obtained a uniform diameter using pultrusion process. The resin used in the preparation of composites was epoxy in combination with hardener. Fibers were used as reinforcement and epoxy resin is used as matrix in the fabrication process. Fibers and epoxy were hybridized at percentage of 70% and 30%. Samples prepared were tested to evaluate its properties, such as tensile strength, compressive strength, impact strength and hardness. Sisal fiber reinforced epoxy composite exhibited better mechanical properties among the five types of fiber composite specimens.

Key words- Sisal fiber, Banana fiber, Jute fiber, Coir fiber, Mixed fiber, Pultrusion process.

I. INTRODUCTION

A composite is a material made by combining two or more dissimilar materials in such a way that the resultant material is endowed with properties superior to any of its parental ones. Natural fibers have been used to reinforce materials for over last two decades. Fiber-reinforced composites, owing to their superior properties, are usually applied in different fields including door panels, trunk liners, instrument panels, interior roofs, parcel shelves, among other interior components, are already in use in European cars due to the more favorable economic, environmental and social aspects of the vegetable fibers, sports goods, aerospace, engineering applications, defence, house hold appliances, decorative items, safety appliances like industrial helmets, etc,. Recently, they have been involved in combination with different materials. Natural fibers are eco friendly, biodegradable, abundantly available, renewable and cost effective, high strength and have less weight. Natural fibers do not possess any type of health hazard properties and finally, provide a solution to environmental pollution by preparing new composites using natural fibers. Natural fibers have the potential to be used as a replacement for traditional reinforcement materials in composites for applications which requires high strength to weight ratio and further weight reduction. Currently, different types of natural fibers have been investigated for use in plastics including flax, hemp, jute straw, wood, rice husk, wheat, cane (sugar and bamboo), grass, reeds, kenaf, ramie, oil palm empty fruit bunch, sisal, coir, water, hyacinth, pennywort kapok, banana fiber, pineapple leaf fiber. Fibers obtained from the various parts of the plants are known as vegetable fibers. Animals can also provide a source of fibers. A wide variety of properties can be achieved through proper selection of fiber type, fiber orientation and fiber reinforcement form. The mechanical behavior of a natural fiber composite depends on numerous factors. For example, fiber length and quality, matrix, fiber-matrix adhesion bond quality and so forth. A good interface bond is required for effective stress transfer from the matrix to the fiber where by maximum utilization of the fiber strength in the composite is achieved . Modification to the fiber also improves resistance to moisture induced degradation of the interface and the composite properties. Mechanical properties of natural fibers especially flax, hemp, jute, banana and very good. A number of investigations have been conducted on several types of natural fibers such as bamboo, banana and jute to study the effects of these fibers on the mechanical properties of composite materials. Information on the usage of banana fibers in reinforcing polymers is limited in the literature. Development of polymer composites with natural fibers and fillers as a sustainable alternative material for some engineering applications, particularly in aerospace applications and automobile applications are being developed. Natural fibers show superior mechanical properties such as stiffness, flexibility and modulus compared to glass fibers. The main advantages of natural fibers are of low cost, light weight, easy production and friendly to environment. Composite materials are intended to combine desired characteristics of two or more distinct materials. The main benefits of exploitation of natural fibers are: abundance and renewability, low cost, non- abrasiveness, simple process, non-toxicity, high flexibility, acoustic insulation and low density. On the other hand, there are some drawbacks such as their poor mechanical properties and high moisture absorption. The latter is due to their hydrophilic nature that is detrimental to many properties, including dimensional stability. Nevertheless, some composite components (e.g. for the automotive sector), previously manufactured with glass fibers are now produced with natural fibers. It have been observed that the effect of fiber length and weight percentage increases the flexural modulus and impact strength when increase in length of fiber and weight percentage of fiber. The strength of short fiber composites depends on the type of fiber matrix, fiber length, fiber orientation, fiber concentration and the bonding between the fiber and matrix. The results show that the tensile strength, young's modulus and water absorption of polyester composites increased with the increasing polyester content but elongation at break decreased. Morphology studied indicates that the tendency of filler- matrix interaction improved with the increasing filler in polyester matrix.

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Effect of different Waste Materials Addition on the Properties of Clay Bricks

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Abstract: ***The disposal of wastes becomes major problems in the world and effects to environment and becoming toxic. Fly ash is one of the many substances that causes air, water and soil pollution. Along with this some other materials like saw dust, rice husk, bagasse also effects the environment pollution and some disturbances to the human activities. In order to save the precious land and soil from being used in manufacturing building bricks and to save the environment from the waste. In this project, the experiment will be done to know whether these materials addition alters the properties of bricks or not. Based on experimental results such as compressive strength, impact strength, efflorescence test, firing shrinkage, apparent porosity, bulk density, water absorption of different batches were calculated. it was concluded that the bricks with the waste material admixture, gave the good quality.***

Keywords: Clay, ash fly, rice husk, saw dust, bagasse, compressive strength, impact strength, efflorescence test, firing shrinkage, apparent porosity, bulk density, water absorption.

I. INTRODUCTION

Bricks plays a major role in construction industry and disposing some waste materials can lead to pollute the environment directly or indirectly. Some make disturbance to human activity and some becomes toxic to the nature (such as industrial wastes like fly Ash). Hence it becomes crucial to reuse the vast amount of different waste materials. A lot of research has been done on recycling the waste products in our daily experiences. This project conducted to save the precious land and soil from waste materials by being used in manufacturing building bricks and to save the environment from the waste.

Surender Malik et al (2015) prepared 3 types of bricks the former one in 100% Clay, second one is a mixture of 5% Fly Ash in clay (95% Clay+5% Fly ash) and another as 5% mixture of rice husk ash in clay(95% + 5%) in six samples of each and conducted compressive strength test on compression testing machine and water absorption test, results as fly ash content brick gives more compressive strength than conventional clay bricks and less water absorption nature. Rice husk ash brick results more water absorption in nature but with stands less compressive strength. Clay brick had high specific gravity than remain bricks containing rice husk ash and fly ash. [1]

David N Githinji et al (2015)study states that clay bricks were fabricated using different proportions of sawdust and polystyrene material,it results increase in non-clay material tends to decrease the properties like compressive strength, bulk density and flexural strength and also increase some properties like porosity and water absorption capacity. Particle Image Velocimetry (PIV) method is used to observe the surface deformation under uniaxial loading and made a stress strain curve pure-clay bricks to exhibit brittle failure to be as result of strong bonding between clay particles. [2]

Utsarga Choudhury (2013) prepared bricks using industrial major waste fly ash as admixture to clay with different compositions and conduct various tests to make various measurements like Rolling limit, Drying shrinkage, Firing shrinkage, Apparent porosity, Bulk density, Water absorption, And states that increase in fly ash content in composition increases the rolling limit and bulk density and decreses properties like firing shrinkage, drying shrinkage, absorption and apparent porosity. [3]

Haili Cheng et al (2016) fabricate bricks from waste and broken clay bricks which are rejected in quality control depertment by inspection methods and some of waste bricks from building which are collapsed, and results are not best compared to normal fabricated bricks because thermal stresses are increased while firing the bricks and tends to cracks in bricks and alkali nature gets increased which increses efflorescence of bricks it effects the wall by forming white or gary layer. [4]

Kedsarin pimraksa et al (2001) prepared bricks with 100% fly ash but of different grades as sieved –63+40 μm fly ash and sieved –40 μm fly ash in different proportions, it results very high compressive strength and bending strength as 56.3Mpa and 13.1Mpa respectively and does not losses weight after firing not more than 4% so it made firing easy. Due to there is zero percentage of clay

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Heat Transfer Phenomenon of Fluids in Corrugated Plate Heat Exchangers

D.Anjibabu, Shaik Nayeem

Abstract: Heat transfer is great attention in every Industrial application. While designing the heat exchanger two important factors are must be considered one is the least amount of pumping power (minimum Pressure drop) and most efficient heat transfer for given conditions. The configuration of heat Exchangers is extent effects on the above two factors. The corrugated heat exchanger comes under special type of heat exchangers .This type heat exchanger recover more heat than the other type of heat Exchangers because of they are arranged to form a package due to this is compact form of heat having less weight, and less space and providing high heat transfer coefficients than the other types. The heat transfer coefficient and friction factor of water,water+sio$_2$ are determined for flow under corrugated heat exchanger at corrugation angles of30°,40°,50°.Experiments are under taken laminar flow region at bulk temperature of 60° c. The experimental results shows that enhance in Reynolds number causes increase in heat transfer coefficient and 50°corrugated angle gives optimum result due to high turbulence created at low velocities.

Keywords: Corrugated heat exchanger, heat transfer coefficient, Reynolds number, nano particles.

I. INTRODUCTION:

For Energy saving many types of heat exchangers are now available. Heat exchangers can be used many applications relating high heat transfer performance. Corrugated plate heat exchanger are belongs to this category. They are capable of recovering heat efficiently even at low temperature difference mainly because of high turbulence created at low velocity. The corrugated plate heat Exchanger process may unique characteristics of great Significance to Industrial applications. These type of heat exchanger can with stand up to 250^0 and pressure range of 2MPA and made of variety of materials like stainless steel, nickel&nickelalloys, copper and titanium etc depending upon the operations temperature and pressures.The nano particles mixed in conventional fluids may leads to considerable increasing heat transfer coefficient. The nano particle consists of good physical and chemical properties it include high heat transfer rate, better mechanical permanence and higher thermal conductivity because of wide surface area and scaled nano size. The- better heat transfer obtained at minimum spacing .The experiment conducted at three different spacing at 6-mm, 9mm, 12mm .For this purpose 20 parallel plates are arranged with total heat transfer of $1.1629m^2$ [1].

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The heat transfer performance of the corrugated plate heat exchanger is done by using the Buckingham Pi -theorem. The experimental results are contrast with the correlation to recognize flow characteristics and geometry parameters which affect the heat transfer rate [2].Increase in channel spacing and its phase shift angle in corrugated heat exchanger will cause the increase in friction factor. Results are compared with the parallel plates the mean heat transfer coefficient and pressure drop increases from 2.6 to 3.2 and 1.9 to 2.6[3]. CFD code is used for measurement of heat transfer performance of a cross corrugated heat exchanger. Network of resistance method is used for to find out the longitudinal heat conduction effect. This method widely used for heat exchangers design [4].For the experimental purpose two different size of nanoparticles are consider that is 36nm and 47nm .Experimental results shows that the addition of nanoparticles into conventional fluids has produced a considerable enhancement of the heat transfer coefficient that clearly indicates increases with the nanoparticle concentration. Heat transfer coefficient is higher for 36nm [5]. Heat exchanger consists of ARMFIELDFT-43 with flat plate arrangement. The estimated results are compared with those obtained from usual method of single pass arrangements [6]. The rate of heat transfer in corrugated plate heat exchangers is higher as compared smooth tube under at turbulent fluid flow region of Reynolds number 5500 to 60000 by water is used as a working fluid. Heat transfer rate increases due to the increase in heat capacity ratio, flow arrangement, number of channels used and relationship between the heat transfer performances [7]. Theoretical results are compare with experimental results. By changing geometric parameters like aspect ratio, hydraulic diameters are used for calculation of convective coefficients this results are compare with experimental ones [8]. Under constant temperature range the convective heat transfer coefficient and friction factor of TiO_2/ water and SiO_2/water nanofluids are determined at turbulent flow filed of Reynolds number ranging from 5000 to 25000 and for volume concentrations ratio up to 3.0% [9]. They development of three different type sections that are offset fin, wavy fin and non-uniformity characteristics of the inlet fluid flow. For experimental purpose air is used as a working fluid. Better results obtained for wavy fin characteristics [10]. The angular cut wavy tape inserts with wave ratio and different inlet velocity. By using angular wavy tape leads increase in heat transfer as compared to no angular cut wavy tape. This type particularly useful in solar preheaters and heat exchangers [11]. Commercial code fluent is used for flow visualization. Secondary flows inside wavy duct causes pressure drop will be in more in those that of the smooth circular duct and the Reynolds number increases with the average mass transfer [12-13].

II. THE EXPERIMENTAL SETUP:

MECHANICAL-A (BATCH NO-15)

FABRICATION OF DUAL ACTING CAN CRUSHER

(30)

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Abstract: Now a days, recycling is rapidly increasing day to day. The amount of wastes coming out is increasing in tremendous quantity. Aluminium cans and tin plates cans are one of the important products. That why we choose this project is about fabrication of double acting can crushing machine. It is a mechanical can crusher to help the people to crush the cans easily. Normally in single acting crushing machine the required work (crush) is done one time only at a rotation of crank. But, in the double acting crushing machine the work (crush) is done two times at a rotation of cycle. When the rotary motion from the motor is converted into reciprocating motion by the crank which is in turn connecting to the piston that crushes materials.

Keywords: Aluminium can, Can crusher, Slider crank mechanism.

I. INTRODUCTION

The main purpose of the project is to get knowledge of the fabrication of the double acting can crushing machine. Aluminum can recycling is the process by which scrap aluminum can be reused in products after its initial production. The process involves simply re-melting the metal, which is far less expensive and energy intensive than creating new aluminum through electrolysis of aluminum which must first be mined from bauxite ore and then refined using the Bayer process. Since cans are best way to preserve food therefore there use in preservation of food is in creating day by day. The other fact is that these cans can be recycled easily and does not affect the environment like politeness. But at the time of waste handling and its transportation these cans must occupy minimum space or possible so as to store and transport them in large quantity and here comes our can crusher.

II. SLIDER CRANK MECHANISM

It is a arrangement of mechanical parts designed to convert straight-line motion to rotary motion, as in a reciprocating piston engine, or to convert rotary motion to straight-line motion, as in a reciprocating piston pump. The slider-crank mechanism is a particular four-bar linkage configuration that exhibits both linear and rotational motion simultaneously. This mechanism is frequently utilized in undergraduate engineering courses to investigate machine kinematics and resulting dynamic forces. The position, velocity, acceleration and shaking forces generated by a slider-crank mechanism during operation can be determined analytically. Certain factors are often neglected from analytical calculations, causing results to differ from experimental data. The study of these slight variances produces useful insight. The following report details the successful design, fabrication and testing of a pneumatically powered slider crank mechanism for the purpose of classroom demonstration and experimentation. Transducers mounted to the mechanism record kinematic and dynamic force data during operation, which can then be compared to analytical values. The mechanism is capable of operating in balanced and unbalanced configurations so that the magnitude of shaking forces can be compared. The engine was successfully manufactured and operates as intended. Data recorded by the device's accelerometers is comparable to calculated values of acceleration and shaking force.

III. COMPONENTS OF CAN CRUSHER AND CONSTRUCTION

1. Base frame:

Base frames are used to support mechanical equipment and provide rigid platforms for attachment of vibration isolators, without allowing excessive differential movement between driving and driven members. The bases provide a means by which the equipment can be stabilized and motion reduced by lowering the equipment center of gravity.

2. Connecting rod:

A connecting rod is a rigid member which connects a piston to a crank or crankshaft in a reciprocating engine. Together with the crank, it forms a simple mechanism that converts reciprocating motion into rotating motion.

3. DC motor:

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic; to periodically change the direction of current flow in part of the motor.

4. Bolts and Nuts:

Bolts and nuts are used in several applications, with a primary function to hold things or components together. A bolt, also known as a screw, does not always have to be used together with a nut; however, a nut is always used together with a bolt. Nuts and bolts serve as the fundamental components in several construction projects as they provide strong bonds that do not break even under great amounts of pressure.

FLOOR CLEANING ROBOT WITH DUAL ROTATING BRUSHES AND ANDROID APP BASED CONTROL

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Abstract : Households of today are becoming smarter and more automated. Home automation delivers convenience and creates more time for people. Domestic robots are entering the homes and people's daily lives, but it is yet a relatively new and immature market. However, a growth is predicted and the adoption of domestic robots is evolving. In this proposed system, we have designed a Bluetooth based Wireless Floor Cleaning Robot with Dual Brush cleaning mechanism.

IndexTerms **- Microcontroller, Bluetooth module, Motor driver, Relay, LCD Screen.**

I. INTRODUCTION

Robot is an intelligent device having its own brain fed with computer logic so that it can do the work according to the algorithm designed. Autonomous movement of vehicle is guided by the logic controller designed. Robots plays an important role in each every field of life. It is used in industries, in households and in institutes. The robots are just becoming as intelligent as human now a days. Mostly an average human uses 2-3 robots per day in his day to day life.

Mechanical control devices are used to control the flow or movement of materials or any other parts present in the device. Actuators are used for controlling a mechanism which ultimately controls a part of the device. Microcontroller is the brain of robot where program is written and sensors are connected as input and actuators as output. The controlling of the robot is governed by various algorithms like fuzzy controller, machine learning based practices and artificial neural network based algorithms. Depending upon the environment value received to the controller it eliminates the error and transits from one state to another.

The research and development of an autonomous mobile robot and a Manual Phone Application Control prototype able to clean a room or even an entire house is not a trivial challenge. These robots operate semi- or fully autonomously to perform services useful to the well-being of humans and equipment. With the aim of keeping our robot as simple as possible, while able to perform the initial goals, i.e. an autonomous vacuum cleaner robot able to randomly navigate through a room or a house with the minimum human assistance.

In this proposed system, we have designed a Bluetooth based Wireless Floor Cleaning Robot with Dual Brush cleaning mechanism. The system uses batteries to power the vehicle movement motors as well as the floor cleaning motor. We use a Battery Charger to charge this battery. The Floor cleaning Motor and vehicle motors are interfaced to a AVR microcontroller unit that controls the working of all the motors. Motor driver is used to drive DC geared Motors. Bluetooth Module is used for Wireless Connectivity between Android Phone and Floor Cleaning Vehicle.

To control the Movement of the Robot, Bluetooth Technology is used. User has to connect this Robot using Bluetooth based Android Application. Communication between the robot and user is done using RF2.4ghZ Frequency. We can control the Robot Movement Left / Right / Forward / Backward / Cleaning Brush-Control using this Application. Using this feature, user can clean any corner of the floor using this Application

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EXPERIMENTAL EVALUATION FOR THE PERFORMANCE OF VCR DIESEL ENGINE BY USING CALOPHYLLUM INOPHYLLUM BIO DIESEL WITH NANO ADDITIVES OF ALUMINIUM OXIDE

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ABSTRACT

Day by day vehicle population in the world is increasing and usage of fossil fuel is also increasing. The countries like INDIA are depending on other countries for the petroleum-based fuel and it will affect the development of the country also. The India has lot of resources to produce Liquid alternate fuels like Ethanol, Methanol, and Bio-Diesel etc. The viscosity of the Bio diesel is high compared to diesel fuel. So, due to high viscosity the atomization of fuel is less causes poor combustion, high in emissions. To overcome these problems Nano metal oxides are utilizing as a fuel additive in fuels for increasing the combustion as well as to reduce the emissions. The metal oxides like zinc oxid0e (ZnO), Cerium Oxide (CeO_2), Aluminum Oxide (Al_2O_3) will donate the oxygen molecule in lattice structure during combustion process causes proper combustion. The present work is to check the performance, parameters of a CALOPHYLLUM INOPHYLLUM bio diesel and its blends (CIB10, CIB20, CIB30 and CIB100), results are compared with the diesel fuel. The aluminum oxide is added to the best blend at a proportion of 25 ppm,50 ppm and 75 ppm and the performance and emissions parameters are investigated.

Key words: Aluminum Oxide Nano Particles, Bio Diesel, CALOPHYLLUM INOPHYLLUM, Emission, Performance

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DESIGN AND FABRICATION OF WATER PUMPING SYSTEM USING WIND MILL

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B.Pavan kumar*

B.Arun bhaskar*

A.Jnanendra*

K.Vijay kumar*

ABSTRACT

In our project wind energy is used to rotate the wind blades. This blade coupled to the shaft. At the end of shaft the flywheel is placed. The eccentric arrangement is provided in the flywheel. When the blade rotates automatically flywheel also rotates. Due to the eccentric arrangement the rotation motion of the flywheel is converted into linear motion. This reciprocating motion is given to the handle of the pumping system. The up down motion of the handle is given to the piston, where the water is sucked using pressure variation from lower ground. Finally the water is supplied to the outlet. Wind blade provides the continuous motion which helps to supply the water continuously .Since time immemorial, the main source of energy has been coal, oil, natural gas, nuclear energy, wood and coal. However, all these sources are limited and are the main cause of pollution and this has led to development and more focus on sustainable energy supply with minimum pollution effects. Hence research and analysis has shown that wind energy, solar energy and biomass are the most prominent solutions to the above problems because they are eco -friendly and readily available in nature.

KEYWORDS:VAWT, HAWT, solidity, eccentric pump connection, reciprocating pump.

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DESIGN AND FABRICATION OF ROPE MAKING MACHINE

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Abstract: A rope making machine is used for production of different types of wires such as accelerator wires, power transmission wires, etc. depending on applications and sizes of machines. In conventional machine, number of gears and space required is more .Also it is robust in construction.

In our modified machine, we use the synchronous AC motor to transmit power to frame, which is attached to the other end of synchronous motor. An epi-cyclic gear system is attached to the frame which provides rotation to the bevel gear system due to which spindle get rotated and winds the rope over it. Due to the rotation of frame wire get twisted .Because of simultaneous operation of twisting and winding of wires, the rope get produced.

Keywords –**Winding, wire rope, spur gears, load distribution, Epi-cyclic gear train.**

I. INTRODUCTION:

Our project work, rope making machine presents the work of making a rope from the four single strands which are twisted into a single rope and that rope is rotated onto a spool which is fixed as the head of the machine. Four strands were twisted together to make a rope. The strands were attached to the same hook. Three planetary gears which are induced in an internal gear are the ones that twists the single stranded spools and thus twisting the strands into a rope. The rope stayed together because the twists went in opposite directions. This machine will run by an AC motor which have a capacity of 0.25 Hp and has a 1460 rpm of speed. By making this machine the production of the rope will be more when compared to that of making of rope by human effort, which eventually saves time and labor cost and increases the production rate of the rope making.

The epi-cyclic gear worked winding machine winds a material, for example, metal wire, string or paper, onto a center, spool or bobbin. The paper manages the pedal worked winding machine. So we are exhibiting a creative technique for manual worked winding machine. This will eventually diminish cost and time. In any case, the fundamental favorable position is that we are proposing the strategy that is totally going to take out the high cost.

There are a couple of unmistakable sorts of turning machine from essential manual urge machine to complex PC numeric control (CNC) machines. A part of the more run of the mill utilizes for winding machines are twist winding, rope winding, and determined fiber winding. A curl winding machine is one of the kinds of winding machine that accessible in ventures today.

The loop winding machine can be arranged by their speed levels and limit. The regular utilization of curl winding machine is to twist loop for a transformer pointer engines and gags. Numerous ventures utilize this gadget including material, hardware, and wire businesses. A manual winding machine ordinarily has an inside on hub and the customer energizes wire, rope or other material onto the middle.

The customer controls the pivot speed and supports the material through client hands, overseeing it to control the weight and load plan. These essential machines may be of a seat top size or tremendous stay singular winder. In this project we are going to design and fabricate a rope making machine. The main work that is done on this machine is that it will take four single threads and by twisting them, they will turned out into a rope. This machine will run by an AC motor which have a speed of 1460 rpm (0.25 Hp)

2. HARDWARE USED

AC Motor:

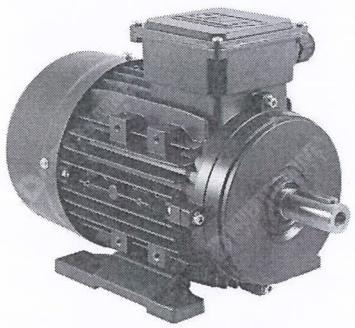

Fig-1: AC Motor

DESIGN AND FABRICATION OF MAGNETIC LEVITATING FRICTIONLESS VERTICAL WINDMILL

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ABSTRACT: Wind energy is one of the renewable energy source, power generation by using wind energy is found to be multifold due to more demand and supply gap in electrical energy system. Magnetic levitation wind turbines have several advantages over conventional wind turbines. For instance, it is able to use winds with starting speeds as low as 1.5 meters per second (m/s) because of negligible friction achieved with the help of magnetic levitation created and due to the assistance from magnetic field. Also, the it could operate in winds exceeding 40 m/s. Hence maglev wind turbine has a great future potential in terms of energy generation. In this aspect the current project work would like to address certain design issues and proposes to design, fabricate and test a prototype of magnetically levitated vertical axis wind turbine providing stated advantages, the prototype will be fabricated and tested for the outcome.

KEY WORDS: Magnetic levitation, Vertical wind turbine and generator, Wind energy, Neodymium magnets

I. INTRODUCTION:

Wind power Technology has played a significant role in power production. The wind turbine is used for converting kinetic energy of wind into electrical energy. The wind with velocity strikes the blades, then the wind spin a shaft, which connects to a generator and produces electricity. The Magnetic levitating vertical wind turbine is designed in such a way that it reduces the friction. The main advantages are that it is frictionless and it uses magnetic levitation and it does not need to vast spaces required by more conventional wind turbines. It also requires little maintenance if required. The unique operating principle behind this design is through magnetic levitation which is supposedly an extremely efficient system for wind energy. The vertically oriented blades of the wind turbine are suspended in the air replacing any need for ball bearings. The aim of this project is to design and implement a magnetically levitated vertical axis wind turbine system that has the ability to operate in both low and high (1.5m/s to 40m/s) wind speed or velocity conditions. This new model of wind turbine uses magnetic levitation to reduce the internal friction and this magnetic levitating frictionless vertical wind turbine produces more energy than a conventional turbine, at the same time decreasing operational costs by 50% over the traditional wind turbine. Hence this technology provides an extreme efficient, versatile and elegant method of producing power from wind with nearly zero pollution. The choice for this model is to showcase its efficiency in varying wind conditions as compared to the traditional horizontal axis wind turbine and contribute to its steady growing popularity for the purpose of mass utilization in the near future as a reliable source of power generation. Hence the main objective of this project is to harness wind energy in more efficient way with frictionless magnetic levitated operation.[1]

II. Principle of magnetic levitation:

Magnetic levitation (Maglev) is a method by which an object is suspended without any support with the help of the strong magnetic field. The repulsive force of magnets used for reduction of effect of gravitational force significantly. Magnetic force is used for reducing of gravitational force and to lift up the objects in air. By this technique implementation of this vertical axis wind turbine is used for having negligible friction and there by the wind turbine starts rotating at lower wind speeds[2].

Also known as magnetic levitating, this phenomenon operates on the repulsion characteristics of permanent magnets. This technology has been predominantly utilized in the rail industry in the Far East to provide very fast and reliable transportation on maglev trains and with on-going research its popularity is increasingly attaining new heights. Using a pair of permanent magnets like neodymium magnets and substantial support magnetic levitation can easily be experienced. By placing these two magnets on top of each other with like polarities facing each other, the magnetic repulsion will be strong enough to keep both magnets at a distance away from each other. The force created as a result of this repulsion can be used for suspension purposes and is strong enough to balance the weight of an object depending on the threshold of the magnets. In this project, it is used to implement this technology form the purpose of achieving vertical orientation with the axial flux generator.

FLOOR CLEANING ROBOT WITH IoT BASED CONTROLLER

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Abstract: Households of today are becoming smarter and more automated. Home automation delivers convenience and creates more time for people. Domestic robots are entering the homes and people's daily lives, but it is yet a relatively new and immature market. However, a growth is predicted and the adoption of domestic robots is evolving.

In this proposed system, we have designed a IoT based Wireless Floor Cleaning Robot with Dual Brush cleaning mechanism. The aim of this project work is to develop and modernized process for cleaning the floor; hence it is widely used in house, hospitals, shops, office, etc. This system is designed by using microcontroller, Wifi module for wireless communication and Ultrasonic sensor for obstacle detection and avoidance.

Keywords – **Microcontroller, Node MCU, Motor driver, LCD screen, Brushes.**

I. INTRODU CTION

In present days, robotic cleaners have taken major attention in robotics research due to their effectiveness in assisting humans in floor cleaning applications at homes, hotels, restaurants, offices, hospitals, workshops, warehouses and universities etc. Basically, robotic cleaners are classified on their cleaning technique like floor mopping, dry vacuum cleaning, sweeping etc. Some products are based on simple obstacle avoidance using infrared sensors while some utilize laser mapping technique. All cleaning and operating mechanism of robotic floor cleaners has its own advantages and disadvantages. For example, robots utilizing mapping are relatively faster, and energy efficient but costly, while obstacle avoidance based robots are relatively less time consuming and less energy efficient due to random cleaning. The main objective of this work is to fabricate a smart floor cleaning vehicle using IoT based control.

IoT or internet of things is an upcoming technology that makes use of internet to control/monitor electronic/mechanical devices, automobiles and other physical devices connected to the internet. IOT gives user the ability to control and monitor more than digital things easily through a comfortable GUI over the internet.

In this proposed system, we have designed a IoT based Wireless Floor Cleaning Robot with Dual Brush cleaning mechanism. The system uses 12V batteries to power the vehicle movement motors as well as the floor cleaning motor. We use a 12V Battery Charger to charge this battery. The Floor cleaning Motor and vehicle motors are interfaced to a Node MCU microcontroller unit that controls the working of all the motors. L293D Motor driver is used to drive 12V DC geared Motors. Wi-Fi based internet connectivity is provided using ESP866 Wi-Fi Module.

To control the Movement of the Robot, IoT Technology is used. User has to connect this Robot using IoT based Android Application. Communication between the robot and user is done using Wi-Fi Internet Connectivity. User can access and control the robot Movement wirelessly from anywhere in the world. He / She can control the Robot Movement Left / Right / Forward / Backward / Cleaning Brush-Control using this Application. Using this feature, user can clean any corner of the floor using this Application.

In this project Blynk app is used to control the movements of the bot. Blynk is a Platform with iOS and Android apps to control Microcontrller, Arduino , Raspberry Pi and the likes over the Internet. It's a digital dashboard where you can build a graphic interface for your project by simply dragging and dropping widgets. It's really simple to set everything up and you'll start tinkering in less than 5 mins.

Blynk is not tied to some specific board or shield. Instead, it's supporting hardware of your choice. Whether your Arduino or Raspberry Pi is linked to the Internet over Wi-Fi, Ethernet or this new ESP8266 chip, Blynk will get you online and ready for the Internet Of Your Things.

3DOF ROBOTIC ARM WITH IoT BASED CONTROL

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Abstract: - The ongoing revolution of Internet together with the growing robotics in many activities of everyday life. Internet of things has taken over all the heavy loads from human to itself. Internet of Things (IOT) is basically a connection of many devices to interconnect themselves. As Robots are used to help mankind in various environments if we combine the Robots and Internet of things we can achieve more than we can think of. This project discusses technological implications, open issues, and target applications in the IoT-aided robotics domain.

Keywords – **Microcontroller, Node MCU, Motor driver, LCD screen, RF camera.**

I. INTRODU CTION

For the people who are indulged in electronics either as a hobby or as a profession who kind off happens to have more interest in robotics this project is the key in which most of precise work which humans cannot do repeatedly, this is where a robotic arm or we can say a pick n place robot comes into picture.

Robotics is the branch of mechanical engineering, electrical engineering and computer science that deals with the design, construction, operation, and application of robots, as well as computer systems for their control, sensory feedback, and information processing. A Robotic arm is a type of mechanical arm, usually programmable, with similar functions to a human arm; the arm may be the sum total of the mechanism or may be part of a more complex robot. The links of such a manipulator are connected by joints allowing either rotational motion (such as in an articulated robot) or translational (linear) displacement.

The internet of things (IoT) is the network of physical devices, vehicles, buildings and other items embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data. The IoT allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit. When IoT is augmented with sensors and actuators, the technology becomes an instance of the more general class of cyberphysical systems, which also encompasses technologies such as smart grids, smart homes, intelligent transportation and smart cities. Each thing is uniquely identifiable through its embedded computing system but is able to interoperate within the existing Internet infrastructure.

ENHANCEMENT OF WELD BEAD HARDNESS BY EMPLOYING RANDOM VIBRATION DURING ARC WELDING

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Abstract. Welding is one of joining process, in which high residual stresses are developed. To decrease these stresses, methods like heat treatment and shot peening are used in earlier days. But these methods require separate equipment and also consume lot of time. To reduce cost of extra equipment and reduce time a new technique is developed in the present work. In this technique vibrating table stand is fabricated with the help of arc welding, Random vibrations are generated by the rotation of cams and shaft arrangement attached at the bottom of the vibrating table. Speed of the cam shaft is varied by controlling the Rheostat and autotransformer. Experiment is conducted on the mild steel work pieces at five different speeds of cam shaft (800 rpm, 850 rpm , 900 rpm, 1000 rpm and 1100 rpm). Hardness tests are carried out on the welded work pieces by Brinell Hardness machine. It reveals that up to 900 rpm cam shaft speed hardness value increases, beyond that speed hardness increases rapidly that leads to cracks in the weld bead.

Keywords: Residual stresses, Heat Treatment, Shot Peening, Random Vibrations, Hardness.

1.Introduction:

Welding is used to join metals with weld joint liquescent or without liquescent, with or without filler metal and with or without pressure. Welding is used almost all manufacturing and industrial areas like Power, Fertilizer, Petro-Chemical, Automatic, Food Processing etc. In most of the welding processes metals are joined by melting the edges by application of heat and filler metal is added in the melting region. Welding process is treated as totally different manufacturing process because of localized, differential heating and cooling of work pieces. The joints welded by arc welding have lower harness value because of faster cooling rate. In welding process solidification process start after formation of nucleation. Nucleus size will grow with solidification.

Welding is not a 100% defect free manufacturing process. The defects like residual stresses, blow holes and porosity are leads due to the factors like welding speed, weld angle, current, voltage, environment etc. These defects reduces the durability of welded joints.

Present work focuses on the process of reducing residual stresses in the weld bead. Different thermal cycle (that is heating to peak temperature and cooling at different temperature during welding) are the main reasons for developing residual stresses in the region closed to the fusion boundary (that is heat affected zone).

Compressive residual stresses are developed starting of welding, and these are decreases as the metal is melting and comes to zero when the metal melted completely. So the compressive residual stresses are not a problem in welding process. Tensile residual stresses are developed during cooling of weld bead, because shrinkage is not freely allowed due to metallic or constraints from work piece clamping. These tensile residual stresses are increases until the work piece attains room temperature. The mechanism behind the formation of residual stresses is localized heating and cooling which leads to differential volumetric expansion and contraction of metal around the weld zone.

Residual stresses favours the fracture under external loading. If the load is tensile, the compressive residual stresses increases strength of material shown in Fig.1, where as Fig.2 shows tensile residual stresses decreases the strength of the material under external tensile loading.

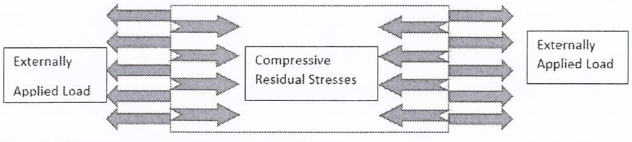

Fig.1 Compressive Residual Stresses

DESIGN AND FABRICATION OF MULTIPURPOSE MACHINE TOOL

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Abstract : The aim of our project is to design and fabricate a multipurpose device. With this device a number of operations can be performed. They are as follows: Drilling, Grinding, Turning, Shaping.

By means of this machine various operations can be performed using same power. So this multipurpose device is used for various operations with a less amount of investment.

Today we see that these operations are the heart of any workshop or machine shop and they are indispensable, so far the time saving of any organization four different jobs on the single machine. This machine perform multipurpose operation at same time which is controlled or operated by induction motor which is run with the help of current.

IndexTerms - **Turning, Depth of cut, Cutting angle, Shaping, Drilling, Grinding.**

I. INTRODUCTION

The project work subject is one, in which actually we are leaning the theoretical concepts in practical way. Also the practical experience is one of the aims of this subject. For a developing industry these operating performed and the parts or components produced should have its minimum possible production cost, then only the industry runs profitably. There are a number of units having used in industries for various purposes.

Drilling:

Drilling is a cutting process that uses a drill bit to cut or enlarge a hole of circular cross-section in solid materials. The drill bit is a rotary cutting tool, often multipoint. The bit is pressed against the work piece and rotated at rates from hundreds to thousands of revolutions per minute. This forces the cutting edge against the work piece, cutting off chips from what will become the hole being drilled.

Grinding:

Grinding Machines are also regarded as machine tools. A distinguishing feature of grinding machines is the rotating abrasive tool. Grinding machine is employed to obtain high accuracy along with very high class of surface finish on the work piece. However, advent of new generation of grinding wheels and grinding machines, characterised by their rigidity, power and speed enables one to go for high efficiency deep grinding (often called as abrasive milling) of not only hardened material but also ductile materials.

Turning:

Turning is a form of machining, a material removal process, which is used to create rotational parts by cutting away unwanted material. The turning process requires a turning machine or lathe, work piece, fixture, and cutting tool. The work piece is a piece of pre-shaped material that is secured to the fixture, which itself is attached to the turning machine, and allowed to rotate at high speeds.

The cutter is typically a single-point cutting tool that is also secured in the machine, although some operations make use of multi-point tools. The cutting tool feeds into the rotating work piece and cuts away material in the form of small chips to create the desired shape.

Shaping:

The shaping machine is used to machine flat metal surfaces especially where a large amount of metal has to be removed. Other machines such as milling machines are much more expensive and are more suited to removing smaller amounts of metal, very accurately.

The reciprocating motion of the mechanism inside the shaping machine can be seen in the diagram. As the disc rotates the top of the machine moves forwards and backwards, pushing a cutting tool. The cutting tool removes the metal from work which is carefully bolted down.

II. LITERATURE REVIEW

Sharad Srivastava [1] Developing the conceptual model of a machine that could perform different and different operations at the same time and should be economically efficient. In this machine, in reality, we are giving impulse to the main shaft, to which the mechanism of the Scotch yoke is connected directly, the mechanism of the Scotch yoke is used for the cutting operation. In the main axis, we use a conical system for power transmission in two positions. The model allows us to perform the operation in different work centers simultaneously, as it receives units from a single power source. The goal of this model is the conservation of electricity (energy supply), the reduction of costs associated with the use of energy, the increase in productivity.

Pradip R. Bodade [2] proposed a machine able to perform operations such as drilling, grinding, cutting and manufacturing of "MULTIFUNCTION MACHINES". The industries are basically destined for the production of goods and services

SOLAR POWERED MULTIPURPOSE MILITARY ROBOT

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***Abstract*:** This Project is designed for Multipurpose Wireless Surveillance Robot for WAR Fields and Rescue Operations. An Unmanned Ground Vehicle (**UGV**) Robot is a vehicle that operates while in contact with the ground and without an onboard human presence. This can be used for many applications where it may be inconvenient, dangerous, or impossible to have a human operator present. Unmanned robotics is being actively developed for both civilian and military use to perform a variety of dull, dirty, and dangerous activities. There are a wide variety of remote-operated UGVs in use today. Predominantly these vehicles are used to replace humans in hazardous situations. Examples are explosives and bomb disabling vehicles.

This Surveillance Robot is controlled through Android Application using Bluetooth Interface within desired range. This Robot is powered using a 12V Solar Panel and a 12V Battery to provide continuous power to Robot. It is Equipped with Metal Detector, which detect any presence of land mine and give a High Audio Alert to the Monitoring Authorities. A RF Camera is used in the Front end of this Robot, to get clear view of nearby image and War field status.

Keywords: Metal detector, RF camera, Bluetooth, Solar panel, Battery.

1. INTRODUCTION

An unmanned ground vehicle (UGV) is a vehicle that operates while in contact with the ground and without an onboard human presence. UGVs can be used for many applications where it may be inconvenient, dangerous, or impossible to have a human operator present. Generally, the vehicle will have a set of sensors to observe the environment, and will either autonomously make decisions about its behavior or pass the information to a human operator at a different location who will control the vehicle through tele operation.

This Project is designed for Wireless Surveillance in WAR Fields and Rescue Operations. An Unmanned Ground Vehicle (UGV) is a vehicle that operates while in contact with the ground and without an onboard human presence. UGVs can be used for many applications where it may be inconvenient, dangerous, or impossible to have a human operator present. Unmanned robotics is being actively developed for both civilian and military use to perform a variety of dull, dirty, and dangerous activities.

2. LITERATURE REVIEW

Tarunpreet kaur et al [1], studied a designed small scale multipurpose military robot manual controllable mode, user controls this security robot from the cell phone which generates dual tone frequency which is detected by DTMF decoder and controls it manually. User will change the path of robot according to the real time visual information of surrounding provided by the camera equipped on robot. Finally, he concludes that the development of security robot which also encourages the use of inexhaustible resources as a power source. This robot also has capability to detect bombs at border and highly defense areas. This security also extends the communication range by using cell phone as a receiver for user.

M. Mobarak Hossain, et al [2], Both are studied on military robot and also given some features on their designed robot, these are mainly used for the both in civil and military fields. The design and placement of various sensors, wheel system, mechanical arms as well as wireless communication mechanism and remote controlling mechanism are discussed here in details. finally, they conclude that these kinds of robots are used in mainly in civil and military fields. For civil use, it can detect gas leak in home or industry, surveillance of shopping mall, parking lot, office, industry, bank, museums, helping rescue operation during natural disaster and aftermath like searching for human, supplying food and other essentials to the people under unreachable ruin.

Dr. S. Bhargavi et al [3], has researched an intelligent combat robot designed specifically for war field. Protection has been provided from enemies. Whenever enemies appear in front of the robot it will fire the laser gun. This remote operation is provided by user sitting at one place. A wireless camera is mounted on the robot. A real time video is transferred to the user pc and whenever enemies are present in front of the robot then user can shoot enemy by laser gun which is operated remote.

DESIGN AND DYNAMIC ANALYSIS ON NON PNEUMATIC TIRES WITH DIFFERENT STRUCTURE

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Abstract: A Conventional tire is made up of air enclosed rubber packed by means of compressed air. Conventional tires over a period have been dominating the world marketplace because it exhibits ride excellence and robustness. But having certain disadvantages like bursting out on driving and regular pressure maintaince. Hence Non-Pneumatic tyres (NPT) were introduced. NPT is a submissive of cellular flexible spoke component which acts as a air of a traditional tire, as the name indicates that it is a type of tire that doesn't use air to support the load .The properties of NPT like contact pressure, rolling resistance and load carrying capacity can be varied by altering the dimensions or material used to manufacture NPT.The main objective of the project is design different structures of wheel spokes in CATIA workbench and analyze by applying the boundary conditions and getting results over stress, strain and total deformation

Index Terms **– Non Pneumatic tyres, CATIA, ANSYS.**

I. INTRODUCTION

A tyre is most important part of any vehicle. Tyre is a rubber member which provides cushioning effect as well as provides clearance to vehicle. . Tyre which is used in automobile, bicycle, motorcycle is pneumatically inflated structures which provide a good rolling, cushioning effect. Such tyre is using numbers of year and they are developing. Some companies are trying to develop tyre which are airless that means they are non-pneumatic. Michelin and Bridgestone is the tyre which are firstly design, they are non-pneumatic. . Michelin and Bridgestone is the tyre which are firstly design, they are non-pneumatic.

In recent years, with the increasing of vehicle velocity and the expansion of the running environment, the criterions for the tyre are very high. While the ordinary pneumatic tyre has the following several problems:

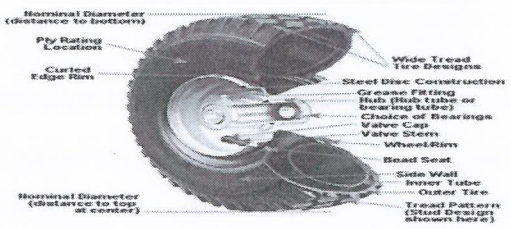
1. 1.It is easy to tie the thorn and burst and the burst may cause fatal accidents.
2. The air pressure inside should be maintained regularly.
3. The manufacturing process is complex.

In military application, the ordinary tyre cannot bear attack from light weapons and landmines, so that will affect the tasks. In pneumatic tire due to the characteristics of pneumatic and rubber the protection ability of ordinary tyre is difficult to be improved, Therefore new structure of tyres are explored and non pneumatic tire appears. The Tweel (a portmanteau of tyre and wheel) is an airless tyre design concept developed by the French tyre company Michelin. Its significant advantage over pneumatic tyres is that the Tweel does not use a bladder full of compressed air, and therefore it cannot burst, leak pressure, or become flat. Instead, the Tweel assembly's inner hub connects to flexible polyurethane spokes which are used to support an outer rim and these engineered compliant components assume the shock-absorbing role provided by the compressed air in a traditional tyre.

TYPES OF TIRES:

I. Pneumatic tyre:

Pneumatic or air filled tyre is tyre which is made up of hard rubber and work on compressed air. A tread, usually reinforced with steel belting or other materials, covers this inner core and provides the contact area with the road. The pressure of the air inside the tyre is more than atmospheric air pressure, so the tyre remains inflated even with the weight of a vehicle resting on it. The tyre air pressure provides resistance against forces that try to deform the tyre, but it gives to a certain degree of cushioning effect as the tyre hits bumps in the road.



Pneumatic tyre

Advantages of non pneumatic tyres:

1. Simple in assembly
2. Low rolling resistance
3. Better cooling
4. Longer tread life

DESIGN AND FABRICATION OF PNEUMATIC SHEET METAL CUTTING MACHINE

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Abstract: The objective of the project is to prepare a machine which cuts sheet metal without human efforts but operates pneumatically. Compressed air is used as working media. The compressed air moves the blades of the machine to cut the sheet of the metal. we are using scissors for simple sheet metal cutting. It is a manual method so that sheet metal are to be wasted some time because of mistakes happened such as wrong dimension etc.., and also even a simple cutting may take long time Hydraulic machines are also available for sheet metal cutting. But the method is used for only heavy metal cutting and its cost is very high. We are using a pneumatic system for sheet metal cutting in a easy way. It is operated by a pneumatic hand lever of two way control valve. Control valve is operated by a compressor. In general manual sheet metal sheering machine metal is placed in between the two sheering blades of machine and the lever is pulled down to move the upper movable blade and cut the work-piece but in that machine large force is required which can make tire to a worker who continuously works on it for mass production in large scale industry; so to reduce the human efforts pneumatic machine should choose. Hence for some development of machine, we have chosen this subject for our project. We that a good idea we develop and we can use it in many industries in surroundings and our practical knowledge, team-working skill, leadership skill will be improved.

***Key Terms*- Sheet Metal, Magnetic Permeability, Pneumatic Double Acting Cylinder, Control Valve, Cutting machine.**

I. INTRODUCTION

The project is to perform sheet metal cutting operation effectively with less human effort by incorporating a machine with pneumatic power. The compressed air through Solenoid valve makes the pneumatic cylinder connected to cutting tool to perform cutting operation of sheet metal. Cutting processes are those in which a piece of sheet metal is separated by applying a great enough force to cause the material to fail. The most common cutting processes are performed by applying a shearing force, and are therefore sometimes referred to as shearing processes. When a great enough shearing force is applied, the shear stress in the material will exceed the ultimate shear strength and the material will fail and separate at the cut location. This shearing force is applied by two tools, one above and one below the sheet. Whether these tools are a punch and die or upper and lower blades, the tool above the sheet delivers a quick downward blow to the sheet metal that rests over the lower tool. A small clearance is present between the edges of the upper and lower tools, which facilitates the fracture of the material. The size of this clearance is typically 2-10% of the material thickness and depends upon several factors, such as the specific shearing process, material and sheet thickness. The sheet cutting machine is the heart of sheet metal industries. In some industries, hand sheet cutter is used which is operated manually. In these machines, we are using pneumatic cylinder for sheet metal cutting. These machines should be easy to operate and maintain also. Hence, we are introducing a pneumatic sheet metal cutting machine which will reduce manufacturing cost and minimize industrial labor problems which is the biggest headache for human. The main objective of our project is to perform job holding operation effectively with less human efforts by using a machine with the pneumatic power. This will also reduce the time required for metal cutting. By using this machine we can increase the production rate and automatically the industry will be in profit. Automation plays an important role in mass production. Automation can be achieved through pneumatic form.

The main advantage of pneumatic system is economically cheap and easy to handle.

The manufacturing operation is being atomies for the following reasons.

1. To reduce human efforts.
2. To increase production rate.
3. To increase efficiency of industry.
4. To reduce the work load.
5. To reduce production time.

Advantageous of pneumatic

1. Wide availability of air.
2. Compressibility of air.
3. Easy transportability of compressed air in pressure vessels, containers and in long pipes.
4. Fire proof characteristic of the medium.
5. Simple construction of pneumatic elements and easy handling.
6. High degree of controllability of pressure, speed, and force.
7. Possibility of easy but reasonably reliable remote controlling.
8. Easier maintenance.
9. Explosion-proof characteristic of the medium.
10. Comparatively cheaper in cost than other systems.

SIMULATION ON FLOW OVER THREE CYLINDERS IN EQUILATERAL ARRANGEMENT USING ANSYS (FLUENT)

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Abstract: Numerical simulations on flow over circular cylinders in equilateral arrangement are performed by using ANSYS fluent. The parameters considered are arrangement of equilateral cylinders (α), distance between adjacent cylinders (L/D) and Reynolds number. By varying the above parameters, means for every angle the distance between adjacent cylinders are varied and studied the effect of drag, lift and various contours are studied and the graphs and contour diagram are plotted and the comparision is done by those graphs and diagrams.

Index Terms **– Circular cylinders; Equilateral arrangement; Lift Coefficient; Drag Coefficient; Velocity contours; Pressure contours; Velocity stream lines;**

I. INTRODUCTION

Circular cylinder has an important role in industry because it is a common structure in many industries; it also has various engineering applications. Its practical applications in various engineering areas include tubular and pin type heat exchange systems, processing of fibrous suspensions, screens to dewater coal-water slurries, filtration of sewage sludge and polymer melts, polymer and food processing applications, flow metering devices, electronic cooling, probe and sensors etc. These structures are exposed to either water or air flow, so drag induced forces are experienced by these structures, which could lead to failure. In flow past a circular cylinder the circular cylinder is subjected to boundary layer separation and flow oscillations in the wake region which is formed behind the cylinder in certain Reynolds number range, a periodic flow motion is developed in the wake as a result of boundary layer. Shedding of vortices from either side of the cylinder takes place. This regular pattern of vortices in the wake is called a karman vortex street. it causes an oscillating flow at a discrete frequency. This periodic behavior of vortex shedding leads to unwanted vibrations of the structure. This shedding frequency matches with the resonant frequency of structure failure of the structure may takes place. This circular cylinder is a typical bluff body and is one of the structural components mostly employed. Numerous investigations have been made of the flow past two circular cylinders, which is the simplest case of group, in the last two decades. An extensive review was given by Zdravkovich[1] had found out the flow interference between two circular cylinders in various arrangements. Sumner .etal [2] had found out the Fluid behavior of side-by-side circular cylinders in steady cross-flow. Kim .et.al[3]. Has done simulation of the flow between a pair of circular cylinders in the flopping regime. Richards .et.al[4 had simulated Two staggered circular cylinders of equal diameter in cross-flow. Wind tunnel experiments were conducted to measure the mean aerodynamic forces and vortex shedding frequencies for two staggered circular cylinders of equal diameter in cross-flow. Slaouti[5] .has simulated the Flow around two circular cylinders by the random vortex method. The random-vortex method is used to investigate the flow around two circular cylinders in side-by-side and tandem arrangements. Gu ZF[6] Classifications of flow pattern on three circular cylinders in equilateral– triangular arrangements. Effects of Reynolds number on the heat transfer characteristics of a long (heated) equilateral triangular cylinder are investigated for the range of conditions Re = 50–150 (in the steps of 10) and Prandtl number = 0.71 (air) in the unconfined unsteady cross-flow regime. Tatsuno[7] M,. has studied that the effects of interference among three equidistantly arranged cylinders in a uniform flow. The effects of flow interference among three identical circular cylinders, which were arranged in an equidistant triangular cluster with their axes perpendicular to the uniform flow, were studied at various incidence angles to the uniform flow and at different spacing ratios. Liang .et.al[8],was investigated that the Effect of tube spacing on the vortex shedding characteristics of laminar flow past an inline tube array: a numerical study. The effect of tube spacing on the vortex shedding characteristics and fluctuating forces in an inline cylinder array is studied numerically.

This paper describes the result on flow over three circular cylinders in equilateral arrangement by simulation. Lift and drag coefficients have been investigated for L/D ratios (2 to 4) and for three different angles (0, 30, 60) by using computational fluid dynamics software Ansys Fluent.

PROBLEM SPECIFICATION:

CFD Analysis of Different Bare Submarine Hulls and Finding Optimum Shape

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Abstract: ***This paper deals with finding the optimum shape submarine hull without out considering appendages, means stern planes, sailplanes, rudder, and sail. Here optimum shape is obtained by maximizing the volume of the hull at the same time minimizing the surface resistance. This is obtained by finding the Semnan coefficient of each model of the hull. About 70 percent of energy loss of the submarine is due to surface resistance only which acts on the bare hull. Generally, there are two types of designs of hulls, one is torn drop structure and another one is cylinder middle body structure. This paper deals only with the cylinder middle body structure of hull. It contains three parts bow, cylinder, and stern. The shape of the bow is decided by ellipse equation and the stern shape is decided by parabola equation. By changing the coefficients of ellipse and parabola we can get variations of shapes of bow and stern, thus we can get different shapes of the submarine. In order to calculate the Semnan coefficient, we have to find the wetted area, volume and resistance coefficient. This study involves numerical evaluation of the resistance coefficient by using Computational Fluid Dynamics (CFD).***

Keywords: ***Hull, CFD, Design, Simulations, Submarine, Semnan coefficient***

I. Introduction

Unlike the nuclear submarines, traditional submarines are very short of energy levels especially when they are diving in the sea. The cost of a nuclear submarine is tremendously high compared with traditional ones. Traditional submarines run on the charged batteries in the underwater. It uses energy from diesel engines when it runs on the surface of the sea. And for working the diesel engines, it must breathe air from the atmosphere, since it is not possible when submarine diving into the sea, so we have to depend upon alternate energy source batteries.

This battery banks powered up the submarine for some period after that batteries will be exhausted, so for effective utilization of power, the shape of the submarine must be hydrodynamically smooth. And it must provide a sufficient volume for the installing machinery and staff at the same time we have to reduce the drag friction.

If there is an increase in the volume, then wetted area increases thus causing the drag force will increase. The aim of this study is to provide a sufficient amount of space at the same time minimizing the drag friction. Nearly 70% drag friction due to the bare hull so it is very important to make an optimum design of the hull. The effective utilization of power from batteries gives the long duration of surveillance of underwater vehicle in the sea.

II. Governing Equations

CFD: Computational Fluid Dynamics (CFD) is governed by the formulations of momentum, energy and mass equations which are given in Navier-Stokes equations.

A. Mass Conservation Equation (Equation of continuity):

Mass conservation equation is given as:

$$\frac{\partial \rho}{\partial t} + \nabla.[\rho \vec{v}] = 0 \qquad (1)$$

Where ρ = density and v = velocity of the fluid.

GAS PIPE LINE LEAKAGE DETECTION ROBOT USING IoT AND BLUETOOTH TECHNOLOGY

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Abstract

Nowadays gas leakage and gas detection is a major problem in our daily lives. Also gas wastage is a major issue that needs to be countered. LPG gas is highly flammable and can inflict damage to life and property. To avoid such situations, a considerable amount of effort has been devoted to the development of reliable techniques for detecting gas leakage. As knowing about the existence of a leak is not always enough to launch a corrective action, some of the leak detection techniques were designed to allow the possibility of locating the leak. Our aim is to reduce the risks and design a effective solution to Monitor the Leakage of Gas Wirelessly using IoT technology from anywhere in World. This type of robotic system can also be used to Monitor Long Gas Line Pipe and reduce the threat caused due to manual inspection.

Key words: Gas Leakage, IoT technique, Wireless, Flammable

1.Introduction

Petroleum industry is a giant in terms of technological innovations. Industry is mainly focused on cheaper and cost saving production and exploration method, as well as fulfilling health and safety standards since oil industry is one of the biggest industries that heavily covered by, legal boundaries, safety requirements and international and organizational standards. Therefore, to minimize human necessity and for the safe, efficient and more accurate operations, petroleum industry needs some improvements and new technological benefits – an investment on new applications, that can be useful for long term production and discoveries, are efficient in terms of long term production. That is the main reason behind the usage of pipelines as a main transportation instead of sea, road and rail transport. In short term, implementation of such big tools could be expensive, but it saves costs of labour and other relevant long term operational costs of usage.

2.Literature Review

- TUWien and ARAS, Baku, Azerbaijan [1], This paper gives first an overview on robots in the petroleum industry, focuses on improvements especially in the case of robotic vehicles which move inside a pipeline for inspection reasons, so called in-pipe inspection robots
- Mohammed Y Aalsalem, Wazir Zada Khan, Wajeb Gharibi1, Muhammad Khurram Khan, Quratulain Arshad [2], This data is made available real-time through real-time feeds over the internet. This data helps in easily locating the root cause of the emergency condition.
- Hanan Elazhary[3], This paper discusses emerging research areas including the IoT and the intersection between the IoT and the prominent areas of research cloud computing and mobile computing.
- Mohd Zaki Ghazali, Noorhayati Mohamed Noor, Noraziah Ramly, Sulastri Putit [4], This paper presents the development of a microcontroller based mobile gas sensing robot. The purpose of the robot is to automatically detect gas leakage along a gas

DESIGN AND FABRICATION OF FLOOR CLEANER USING PANTOGRAPH MECHANISM

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Abstract: A semi-automatic floor cleaning machine is developed keeping in mind the basic necessity of less energy consumption, less operational reduction and less the human effort. This is capable of performing cleaning of floor in dry as well as in wet conditions. The mop used follows a straight-line path on the surface of the floor. In this project pantograph and slider crank mechanisms are used. Slider and crank mechanism produce the straight line path but the length of stroke is very small, so a pantograph mechanism is attached to magnify the length so that the cleaning length per stroke is increased. Combining these two mechanisms a floor cleaner machine is developed for cleaning purposes. It is driven by a D.C wiper motor for easy movement of the machine. The wheels used can rotate 360° and are provided with lock for keeping the machine stationary.

Index Terms **- Floor Cleaning Machine, Pantograph Mechanism and Slider Crank Mechanism.**

I. INTRODUCTION

Traditionally floor is cleaned by hand using different handmade cleaning tools and the floor is washed by using different reed brushes. As the time passed new scientific era begins a lot of new methods are used to clean the floor. The first among those was the reciprocating action of brush actuated by muscular force. Floor cleaning machine is very much useful in cleaning floors of hospitals rooms, rooms of houses, auditoriums, porticos of different buildings, bus stands and public places etc. In modern days inside as well as outside cleaning are becoming an important part in our day to day life. Cleaning of dust is a very important for good health conditions. So cleaning is very essential for the current and future generations. Basically floors of houses are cleaned regularly manually. Different techniques are used to clean the different types of surfaces. In this project we are using pantograph mechanism for floor clearing purpose. The advantages of floor cleaning are,

- To avoid injuries or even death of human beings because of slip on the floor due to wrong practices of floor cleaning which are major causes of such accidents.
- To beautify the floor.
- To remove debris and obstructions.
- To remove allergens and dusts.
- To make the environment sanitary (kitchens).
- To maintain traction at optimum level, so that no slip will occur.

Floor cleaning can be done by different techniques and of different kinds. Various types of floors need different kinds of treatment. The floor should be totally dry after the cleaning process. Otherwise it may result in hazards. On some floors sawdust is used to absorb all kinds of liquids. This ensures that there will be no need of preventing them from spill of from the containers. The sawdust has to be swept and replaced every day. This was common in the past in pubs and is still used in some butchers and fishmongers. Tea leaves are also used to collect dirt from carpets and also for odor removing purposes. Different types of floor cleaning machines are available today such as floor buffers, automatic floor scrubbers and extractors that can clean almost all types of hard floors or carpeted flooring surfaces in very less time than it would have taken using traditional cleaning methods. Again the cleaning would be different for different floors.

Here in this work a mechanized scrubbing is introduced using pantograph mechanism. This helps to clean more length in a stroke so that the power and time requirement for cleaning operations is minimized. In addition a slider crank mechanism is added to give a particular path of motion, which is driven by a wiper motor. For easy movement of the machine360° rotatable wheels are provided having a breaking system in it. So that it does not move from rest position.

II.THEORETICAL ANALYSIS

There are many types of cleaning machines or equipment on the market today for both commercial and residential use. Here is a brief overview of the type, power sources and uses of floor cleaning equipment's. For effective cleaning results of any floor or surface, following are the four basic and simple parameters which are to be studied.

- Time
- Agitation
- Chemical

Effect of operating variables on different materials using Abrasive Jet Machining

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Abstract : The application of high speed stream of abrasive particles carried by a gas medium (air) through the nozzle is more obvious for the materials i.e., high sensitive and brittle using abrasive jet machine. In this present work, the parameters such as material removal rate (MRR), pressure and nozzle-tip-distance (NTD) were found with nozzle diameter 2 mm using AJM with a grain size of 20 μin with sand as abrasive. The greater accuracy and surface finish was achieved with minimum diameter and maximum depth with carbide nozzle. Since negligible heat was induced while machining the surface (glass (G), fibre glass (FG) and GI sheet (GI)), the workplace is not subjected to thermal shocks. The maximum MRR with NTD 20mm for glass is $21*10^{-5}kg/m^3$ at a pressure of $8kg/cm^2$, for the fiber glass with NTD 15 mm the MRR is $10*10^{-4}kg/m^3$ at a pressure of $7kg/cm^2$ and finally for the GI sheet with NTD 10 mm the MRR is $27*10^{-4}$ $21*10^{-5}kg/m^3$ at a pressure of $10kg/cm^2$.

IndexTerms – brittle, accuracy, homogenize, perspective.

I. INTRODUCTION

Rapid technology development in the field of new materials and alloys with increasing strength, hardness, toughness, heat resistance and wear resistance have imposed many problems and difficulties during the machining by conventional means.

Machining intricate and complicated shapes of fragile components are accurate and economical forming of very hard. High strength materials which are being extensively used in aero plane and nuclear industries have forced the Scientist/Engineers and technologists to search for new techniques of machining which can rapidly provide an effective solution to these problems.

As a research and development for the last four decades several new machines were emerged. Among the new methods we are going to deal with "TUMBLING MACHINING". The conventional techniques such as drilling, milling, turning, cutting, plaining, shaping…etc., are well known and involves the use of mechanical power & man power between the workpiece and tool whereas in un-conventional machining process those above techniques are not applied because the man power is not involved. It can process through air, gas, water mediums.

II. LITERATURE REVIEW

In this section, the experimental approach was discussed by the various researchers of abrasive jet machine. The researchers are conducted various tests at different parameters such as nozzle-tip distance NTD, carrier gas, air pressure, type of abrasives, mixing composition etc. are focused.

M L Neema and P C Pandey (1977) are together done a research on erosion of glass by abrasive jet. It was experimented on different glass pieces with various abrasives such as Al_2O_3 & SiC. The abrasives with grain size varying between 10 to 50μin and mixed in some composition. It was considered that the abrasives play vital role to cut the glass that govern the metal removal rate. The mechanism of MRR with brittle materials is machined and analytical methods are proposed, and together they proposed an equation to calculate the MRR during indentation.

$$Q = k\,N\,d^3v^{3/2}(\rho a/12_{\sigma y})$$

Where, K is a constant, N is the number of abrasives, d refers the size of the abrasive particles, ρa is the density of the abrasives, v is the velocity of the abrasive particles, σy is the yield stress of the material **[1].**

Dr A K Paul and R K Roy (1987) have done experimental studies on abrasive jet machine. MRR, Abrasive flow rate (AFR), and MRF at various pressures, grain size and nozzles diameter were calculated. Experimentation on glass specimen was conducted at various parameters and based on results drawn graphs for their perspective object. It was observed that with increase in grain size the MRR also increased.
The proposed MFR equation is

$$\mathbf{MFR = MRR\ (g/min)\ /\ AFR\ (g/min)}$$

It was shown a graphical form for every operation done on AJM in a laboratory **[2].**

Iain Finnie (1960) discussed on erosion of surfaces by solid particles which means the AJM setup was operated with the help of fluid stream. The experiment was observed that when fluid impacts with solid particles on to the workpiece the erosion was

Design & Fabrication Of Automated Portable Hammering Machine

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Abstract : **:** Hammering is the most widely used industrial as well as construction activity. Hammering or screws, metal sheets, parts etc requires a lot of time and effort. So here we propose an automated hammering system that allows for fully automatic hammering process. This allows for accurate, fast and automated hammering wherever and whenever needed using a 24V&25W dc motor..We can use Photo electric sensor for metal detection purpose at workpiece bed. The person just needs to insert workpeice and start the hammering machine. We are using dimmerstat for voltage control which is connected to dc motor so that we can control speed of the hammer motion.we are also adding spring so that we can increase the impact force of hammer on the workpiece i.e, spring force is also adding with hammer force.

IndexTerms **– Dimmerstat,Photo electric sensor,Riveting,Forging,**

I. INTRODUCTION

In our college of engineering we are having mechanical workshops we are doing blacksmithy operation for making shapes of various metals like cast iron,mild steel etc.for that purpose we are using hammer for hitting purpose giving hitting force manually.It takes more time for shaping for hot and cold forging operations.Inorder to minimize these difficulties we fabricated Automated portable hammering machine by using this machine we can make shapes very easily and with in less time.We don't require manual force and we also get acqurate shapes.By using dies we can also make different shapes we can also perform riveting and filleting operations.

Automatic portable hammering machine can be considered as the backbone of any hammering operation in mass production its principle function is to safely and preciously hammering work like to perform the punching operation, filleting operation, riveting operation and smithy operation i.e. upset forging etc for all designed operating conditions. This paper describes cad modeling, design and analysis of automatic portable hammering machine. A programmed hammering machine self-working machine going to assume an imperative part in the assembling procedure (hammering process).

Hammering machine utilized as a part of the generation of material extending from instruments, to pivots, car frame forming, molding of metal and so forth. The present development identified with metal squeezing machine and forming machine included certain outstanding challenges in regard of to drive nail, fit parts, forge metal and break separated question. The innovation has for its question cure this downside and to empower, by including helper implies, to drive nail, fit parts, manufacture metal and break separated protest the like. Hammering is the most generally utilized in mechanical operation and also development action. Hammering is the most widely used industrial as well as construction activity. The hammering of screws, metal sheets, metal parts etc. requires a lot of time and effort. So, to minimize the time and effort here you are going to build an automated hammering system.In this prototype model we used slider crank mechanism to convert rotary motion into linear motion. A crank is an arm attached at a right angle to a rotating shaft by which reciprocating motion is imparted to or received from the shaft. It is used to convert circular motion into reciprocating motion, or vice versa. The arm may be a bent portion of the shaft, or a separate arm or disk attached to it. Attached to the end of the crank by a pivot is a rod, usually called a connecting rod (con rod).

The end of the rod attached to the crank moves in a circular motion, while the other end is usually constrained to move in a linear sliding motion. The term often refers to a human-powered crank which is used to manually turn an axle, as in a bicycle crank set or a brace and bit drill. In this case a person's arm or leg serves as the connecting rod, applying reciprocating force to the crank. There is usually a bar perpendicular to the other end of the arm, often with a freely rotatable handle or pedal attached.

Many applications require a machine with reciprocating, linear sliding motion of a component. Engines and compressors require a piston to move through a precise dis- tance, called the stroke, as a crank continuously rotates. Other applications such as sewing machines and power hacksaws require a similar, linear, reciprocating motion. A form of the slider-crank mechanism is used in virtually all these applications.

II. LITERATURE REVIEW:

V.L.Kolmogorov & S.P.Burkin all stated that, Modern science and industry have accumulated many efficient methods of forming by hammer forging, such as setting with shift or torsion, sectional forging, expansion by rolls etc. However, they are difficult for realization on forging equipment, what hampers their adoption in industry. Hence technological conservatism in forging. Even state-off-the-art forging complexes have brought no fundamental change into the hammer forging process.

EXPERIMENTAL ANAYLSIS OF SOLAR POND TO EVALUATE ITS PERFORMANCE CHARACTERSTICS WITH DIFFERNET SALTS

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Abstract : the sun is the largest renewable source of solar energy for the solar pond. The solar pond is a body of salt water which collects solar energy from the sun. The solar pond consist of three different salinity zones. The zones of solar pond having a salt solution .the sun light enters to the pond, the lower zone has high salinity zone and painted with black paint .this layer absorbs high solar energy from sun compared to other zones are less. This project is an attempt to improve the performance of solar pond by using different salts like (magnesium chloride) mgso4, ammonium chloride (nh4cl), sodium chloride (nacl), calcium chloride with varying densities of slats

keywords – solar energy, solar pond, renewable sources ,salts.

I. INTRODUCTION

Global warming is the greatest issue in 21st century. Global warming mainly occurs due to human activities such as transportation, producing electricity and in industries which involves burning fossil fuel. which could lead to a significant decrease in world fossil fuels reserves[.renewable energy technologies have been developed and introduced as an alternative source for energy production; renewable energy technology can produce energy with zero carbon dioxide emissions, unlimited sources and benefits the economy.

Solar energy is one of the essential world renewable energy sources. The conversion of the energy can be operated by several techniques such as photovoltaic systems for producing electricity and solar hot water for heating water with solar energy. Solar ponds have been suggested to be simple and economical in terms of collecting and storing energy on a large scale.

II. SOLAR POND:

It is a natural or an artificial water body used for the collection and absorption of solar radiation from the sun .the solar pond is a shallow deep lake surrounded by the insulating, absorbing and storing materials. The solar radiation from the sun is absorbed by the absorber situated at the depth of solar pond. This results in rising the temperature of the water at the beneath portion of the pond. So for increasing the temperature of solar by mixing of salt solution .the amount of salt concentration increased at lower zone of pond .it absorb high solar radiation and in from of thermal energy .this energy is need for producing steam for power generation.

III. METHODOLOGY

There are different types of methods for solar pond we listed below and we adopted non –convective solar pond method which is economical and absorb high heat from sun.

Methods of solar pond:

1. Gel type solar pond
2. Membrane stratified solar pond
3. Convective solar pond
4. Non convective solar pond.

3.1 Solar pond constructional details:

The solar contains dissolved salts for generating a stable density gradient .it is basically dived into three zones .each zone consist of different salt solution with increasing density. The three zones are divided glass plates. The sun light enters the lower zone of pond with high density of salt solution. This absorbs high solar energy from the sun this zone is high temperature compare to other zones. The constructional details of solar pond as shown in figure(3.1) .the following are the specification of constructed the solar pond give below

TRIBOLOGICAL BEHAVIOUR OF DIFFERENT DISC MATERIALS BY USING PIN-ON-DISC APPARATUS

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Abstract: In the present scenario, metals have very wide applications where generation of friction is the major problem. Due to the continuous friction, wear rate increases which leads to deformation of the metals. The pin-on-disc apparatus is used to find the wear rate between the two different metals. In this experiment Aluminium and Mild steel were used. The wear rate and co-efficient of friction were calculated in two metallic configurations. One of the configurations is High Speed Steel (tool) v/s Mild steel (workpiece) and the another one is High Speed steel (tool) v/s Aluminium (workpiece). In this experiment for both configurations the wear rate and coefficient of friction were recorded at the point loads of 20N,30N,40N. Based on the readings it was concluded that mild steel has less wear rate compared to aluminium at all loading conditions.

Keywords: wear rate, coefficient of friction, tribology, loads, pin on disc apparatus

I. INTRODUCTION:

Tribology deals with friction, wear and lubrication between the two surfaces in relative motion. A Tribometer is an instrument that measures tribological quantities, such as coefficient of friction, friction force, and wear rate [2]. The machines due to wear lose their durability and reliability. Wear can be defined as the phenomenon of removing the material from the surface due to interaction with a mating surface [3]. Wear might have different patterns corresponding to various wear mechanisms. A surface can be subjected to more than one wear mechanism simultaneously [5].

The mathematical formula for finding out the wear rate was given below:

$$\text{Wear Rate} = \frac{W1 - W2}{\rho} / 2\pi RNT$$

Where, $[W1-W2]/\rho$ =Volume of material removed

$2\pi RNT$ = Sliding distance

Friction is a force resisting relative motion, which may occur at the interface between the bodies, but may also occur within the bodies [4]. Mathematically, Co-efficient of friction defines that the frictional force is directly proportional to normal force. Mechanically it shows the relationship between forces which are collaborated with different materials. It is a dimensionless parameter and means that the physical matter doesn't changes by the direction of force [1].

$$F = \mu N$$

$$\mu = \frac{F}{N}$$

Where, F = Friction Force

μ = Co-efficient of Friction

N= Normal Force

II. APPARATUS:

Tribometer is a device which is used to measure tribological properties like Wear, Friction and Lubrication. Tribometer is available in various types which are given below.

1. Pin-on-disc Tribometer,
2. Ball-on-disc Tribometer,
3. Ring-on-Ring Tribometer,

DESIGN AND COMPARATIVE ANALYSIS OF H-SECTION CONNECTING ROD BY DIFFERENT MATERIALS USING ANSYS 19.2

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Abstract: In this work, Design and Static Structural, Dynamic analysis of connecting rod was performed. Connecting rod is one of the most important parts in engine assembly which transfers thrust force from piston to crankshaft and converts the linear, reciprocating motion of a piston into the rotary motion the crankshaft. For this study, H-beam rods are using for different analysis purpose viz. Dynamic analysis and Static Structural analysis by using three different materials viz. ALFA SiC composites, High Strength Carbon Fiber, Beryllium Alloy 25 to carry out the comparative analysis of a Heavy-Duty Engine Connecting rod. For this, Designing of Parametric model of Connecting rod and analysis both will be carried out by using ANSYS 19.2 software. This work addresses the computation of strength and deformation characteristics of H-section connecting rods for Heavy-Duty.

Index Terms: Connecting Rod (H-Beam), ANSYS 19.2, Dynamic Analysis, Static Structural Analysis. ALFA SiC composite, High-Strength carbon fiber, Beryllium alloy 25.

I. INTRODUCTION

A connecting rod can be of two types H-beam or I-beam or a combination of both. They are used respectively depending on their field of application or use. An I-beam is both light weight and strong, but the type of material used limits its capacity to handle load. Whereas an H-beam can handle much more stress without bending. So, they are used in high power engines. The connecting rod is subjected to a complex state of loading. It undergoes high cyclic loads of the order of 108 to 109 cycles, which range from high compressive loads due to combustion, to high tensile loads due to inertia. Therefore, durability of this component is of critical importance. Due to these factors, the connecting rod has been the topic of research for different aspects such as production technology, materials, performance simulation, fatigue, etc. For the current study, it is necessary to investigate finite element modelling techniques, optimization techniques, developments in production technology, new materials, fatigue modelling, and manufacturing cost analysis

II. OBJECTIVE

Objective of this research work is to study the static structural and dynamic analysis of heavy-duty connecting rod by using finite element analysis to find various parameters such as von-mises stress, equivalent strain, total deformation ,mode shape and resonance frequencies of the geometry, occurs in connecting rod at different sections. The objective of this work also includes the exploration of better material for the connecting rod which can be sustained for dynamic loading conditions. For that the design of connecting rod and analyzed theoretically and numerically.

III. MATERIALS FOR CONNECTING ROD

In automobile field, steel alloys, aluminum alloy, titanium alloys are the material generally used for producing the connecting rod based on the application, materials are used. In this work, 3 different materials had been used for analysis purpose which already used for light duty vehicles for analysis and finalized as better materials by comparing with other materials. These 3 materials are used for analysis and there properties are given below:

Material	ALFA SiC	Beryllium alloy 25	High strength carbon fiber
Young's Modules (Mpa)	70000	1.2755E+05	5.16E+05
Poisson's Ratio	0.33	0.285	0.3
Density(g/cc)	2.6116	8.2486	1.6
Yield strength(Mpa)	363	1034.2	710
Ultimate strength(Mpa)	422	1206.6	2500

DESIGN AND FABRICATION OF ORGANIC WASTE COMPOSTING MACHINE

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Abstract :

As India is the most populated country, the increasing population may cause not only decreases the land area but also increases pollution due to dumping of waste. So the organic waste which is dumped is recycled without dumping it in dumpyards. As the organic waste is decomposed by micro organisms in controlled conditions, it takes 30-45days to decompose in traditional way and effects the environment by spreading insects along with odour and gases. This is due to density of waste deposited, high density of waste leads to less rate of decomposition. So this project is going to design and fabricate a mini composting machine with a simple mechanism by using series of stator and rotor blades and a DC motor.

Keywords: organic waste, dumping, decomposition, odour.

INTRODUCTION

Relevance to design practice

Composting is a form of recycling process. Every country is coming forward for recycling of organic waste because 50% Municipal Solid Waste is organic waste. They are looking forward for utilization of dumping area and trying to keep the nearby areas safe from ejected gases. Compost is a type of natural fertilizer with rich nutrients which is formed after the decomposition of organic waste.

Generally composting is done by using green/organic waste, in case of traditional way it takes so many days for microbial decomposition of such waste but modern methods decreases such time due to direct shredding of waste. The shredded waste is rotated with uniform speed by adding water and heat treatment process.The final stage of heat treatment is to prevent the odor and make the waste to store with less moisture and volume. The compost produced is used in small gardens, rooftop farming, etc., .Compost is not only gives high nutrients to soil but also decreases soil erosion.

Methodology:

To go through the various literatures and knowing about different types of compost bins and processes make us to prepare a design that must be rust free and ease of assembling and dissembling with in the compact size. To prepare a basic design by using 3D model. To fabricate a working proto type by using appropriate models of bin for a Indian kitchen.

Design considerations:

Input: Vegetable waste is the input to the system. So the design should be corrosion free.

Handling: Handling of waste is easy as it is easily converted in to the compost form.

Location: As the height of the machine is similar to the height of wash basin height. It is easy to dump the waste and easy to chop the vegetable waste during cooking.

Quick procedure: when compared to traditional process, the time taken by this process is less.

Vertical Windmill Power Generator With Home Automation System

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Abstract :

The aim of this paper is to develop Vertical-axis wind mill are a type of wind turbine where the main rotor shaft is set transverse to the wind (but not necessarily vertically) while the main components are located at the base of the turbine. This arrangement allows the generator and gearbox to be located close to the ground, facilitating service and repair. We have proposed a Vertical Axis Wind Mill to generate Power. This system is designed using PVC Pipes, Fittings, Turbine Blades, DC Motor as dynamo. Power Generated from this Wind Mill is Stored in a 12V Battery. This Battery Voltage is further used to Control 2 Channel Load Such as Bulb and DC Fan, using Wireless Control System (Android App or RF Based Communication). It is used for power storage and control system. a Bluetooth based home automation system with Arduino UNO Board and Android application. Remote controlled home automation system provides a simpler solution with Android application technology. Remote operation is achieved by any smart-phone/tablet etc., with Android OS, upon a GUI (Graphical User Interface) based touch screen operation.

INDEX TERMS - ARDUINO, BLUETOOTH MODULE, HOME AUTOMATION, ANDROID APPLICATION.

I. INTRODUCTION

The recent surge in fossil fuels prices, demands for cleaner energy sources, and government funding incentives, wind turbines are becoming a more viable technology for electrical power generation. Fortunately, there is an abundance of wind energy to be harnessed. Currently, horizontal axis wind turbines (HAWT) dominate commercially over vertical axis wind turbines (VAWT). However, VAWT do have some advantages over HAWT. The main objective of our work is to improve the output of the wind power generation produce electric power using vertical axis wind turbine, Currently, horizontal axis wind turbines (HAWT) dominate the wind Energy market due to their large size and high-power generation characteristics. However, vertical axis wind turbines (VAWT) are capable of producing a lot of power. The generated power is used in a smart home. Control any electrical appliances providing remote access from smart phone using Bluetooth. Bluetooth technology is Wireless radio transmissions in a short distance providing a necessary technology to create convenience, intelligence and controllability [1]. This generates personal area network in home environment, where all these appliances can be interconnected and monitored using a single controller. Home automation involves a degree of computerized or automatic control to certain electrical and electronic systems in a building. Busy families, individuals with physical limitation represent very attractive market for such networking. This system will also assist and provide support in order to fulfill the needs of elderly and disabled in home. A smart home control and monitoring system utilizing smart phone, Android app and embedded micro web server, having IP connectivity to access and control various devices and appliances remotely, has been implemented [2].

II. WORKING PRINCIPLE

2.1 Working of vertical axis wind turbine

Vertical axis wind turbine (VAWT) has four blades, in which the main rotor shaft runs vertically. These blades are wrapped around the shaft and the generator is directly coupled with the main shaft of turbine as shown fig.5.2. The output power generated by wind generator is measured by using multi meter.

2.2 The system consists of an Arduino Uno, Bluetooth module, Relay drivers, step down transformer, Android application.

1) The Bluetooth module is used to connect the devices to operating the appliances within the range ofBluetooth.
2) The Arduino Uno helps in interfacing and processing the signals.
3) Relay drivers act as electro-magnetic switch used to ON and OFF the appliances.
4) Loads are connected by those relays individually.
5) These operations can be displayed on LCD screen.

THE EFFECT OF LUBRICATION ON TRIBOLOGICAL BEHAVIOUR IN PIN ON DISC APPARATUS

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ABSTRACT:

The main objective of this project is to study the tribological behavior of an Aluminum disc under the usage of various lubricants in pin on disc apparatus. Minimization of friction and wear rate is the biggest challenges in machinery components. Therefore, the objective of this project is to experimentally investigate the wear and friction characteristics of the disc material under the usage of lubricants. SAE 140, distilled water and used vegetable oil were used as lubricants in this experimentation to analyze the tribological behavior of the material. Pin on disc type of tribometer is used for this work. The experiments were conducted for constant load of 20N, 30N and 40N. Based on readings it was concluded that SAE 140 has less wear rate compared to the used vegetable oil and distilled water.

Key words: Coefficient of friction, wear rate, lubricant, Pin on disc, tribology.

I. INTRODUCTION:

Tribology is a study of friction, wear, and lubrication. A Tribometer is an instrument that measures tribological quantities, such as coefficient of friction, friction force, and wear rate. Lubrication is the process of using a lubricant to reduce wear rate and friction between two contact surfaces [4].

Friction is the force resisting the relative motion of solid surfaces, fluid layers, and material elements sliding against each other.[1] Mathematically, Co-efficient of friction defines that the frictional force is directly proportional to normal force. Mechanically it shows the relationship between forces which are collaborated with different materials. It is a dimensionless parameter and means that the physical matter doesn't changes by the direction of force [2].

$$F = \mu N$$

$$\mu = \frac{F}{N}$$

Where, F = Friction Force

μ = Co-efficient of Friction

N = Normal Force

Wear can be defined as the phenomenon of removing the material from the surface due to interaction with a mating surface. Causes of wear can be mechanical or chemical. Wear rate is volume loss per unit distance and its unit is (m3/m). It is independent of load applied. The wear rate is affected by factors such as type of loading, type of motion and type of lubricant.

The mathematical formula for finding out the wear rate was given below:

$$\text{Wear Rate} = \frac{W1 - W2}{\rho} / 2\pi RNT$$

Where, $[W1-W2]/\rho$ = Volume of material removed

$2\pi RNT$ = Sliding distance

IC ENGINE WASTE HEAT RECOVERY (WHR) BY USING ORGANIC RANKINE CYCLE (ORC) AND ANALYSIS OF WORKING FLUID SELECTION BY USING MAT LAB

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Abstract: The objective of this project is to analyze waste heat recovery based on Organic Rankine cycle and to understand how the working fluid properties affect the thermal performance of the Rankine cycle-based waste heat recovery systems for internal combustion engines. The thermal efficiency formula is validating under several different operating conditions. A simulation code was developed using MAT LAB, where the working fluid thermal properties were calculated. Working fluid selection is one of the most important procedures in the design of Rankine cycle-based waste heat recovery systems for internal combustion engines. The system's performance, cost, and environmental impacts can be greatly influenced by the properties of its working fluid. In this project we observe and validate using multiple working fluids under different operation conditions.

Key Words: -Organic Rankine cycle, Waste heat recovery, Thermal efficiency, IC engine, Working fluid, MATLAB.

1.INTRODUCTION

1.1 WASTE HEAT

Many processes, especially in industrial applications, produce large amounts of waste or excess heat, i.e., heat beyond what can be efficiently used. Waste heat is heat generated in a process by way of fuel combustion or chemical reaction, which is usually discarded into the environment and not utilized. Waste heat recovery (WHR) methods attempt to extract some of the energy that otherwise would be wasted. The mechanism to cover the unused heat depends on the temperature of the waste heat gases and the economics involved. Typical methods of recovering heat in industrial applications include direct heat recovery to the process itself, recuperators, regenerators, and waste heat boilers. If some of the waste heat could be recovered, then a considerable amount of primary fuel could be saved. An important issue to consider is that in many applications, especially those with low-temperature waste heat streams.

1.2 CLASSIFICATION OF WASTE HEAT

Waste heat can be classified as high, medium, and low-temperature

- Waste heat at temperatures between 923 and 1,873 K is considered high-temperature waste heat and results from devices, such as solid waste incinerators and zinc, aluminum, and copper refining furnaces, among others
- Waste heat, which ranges from 503 and 923 K is considered medium-temperature waste heat. Some examples of medium-temperature waste heat sources are steam boiler exhaust (503–753 K), gas turbine exhaust (642–813K), and reciprocating engine exhaust (588–873 K), among others
- Waste heat at temperatures between 328 and 503 K is considered low-temperature waste heat. Examples of low temperature waste heat include process steam condensate, cooling water from furnaces, etc.

1.3 WASTE HEAT RECOVERY BY ORC

Waste heat is energy that is rejected to the environment. It arises from equipment and operating inefficiencies, as well as from thermodynamic limitations on equipment and processes. Often, part of waste heat could potentially be used for some useful purpose. At present, about 20 to 50% of energy used in industry is rejected as waste heat. A significant part of this wasted energy is low-temperature heat that is sent to the atmosphere mainly from cooling water, fin-fan coolers and flue gases. Usually, distillation column overhead streams at temperatures of 100–200C reject heat by fin-fan coolers, and streams at a temperature less

FABRICATION OF FOUR WAY HACKSAW MACHINE BY USING SCOTCH YOKE MECHANISM

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Abstract: In workshop, for mass production there is a need to cut the raw material into number of pieces and this can be performed conventionally on a power hacksaw or simple hacksaw machine. In this project, an effort has been put to fabricate a modernized four-way hacksaw machine, which performs less stressful operations for cutting wood, metal and plastic materials. A four-way hacksaw machine is developed keeping in mind the basic necessity in production field, less operational reduction and less human effort. This is capable of cutting four work pieces at a same time. This uses a scotch yoke mechanism to give the reciprocating motion to the hacksaw frames. In this, the cutting stroke to all the frames are in equal and also, we are using two yokes in number to guide the frames by inserting a pin into yokes. It is driven by an electric motor of high rpm to give the rotation to the eccentric disc. The work pieces are placed in bench vises which are placed beside the frames.

Index Terms **- Four-way hacksaw machine, scotch yoke mechanism.**

I. INTRODUCTION

In present condition many electrically operated power hacksaw machines of different specifications are available for the use in shop floor. These machines are so precise that they can cut wood material with minimum times made up of different materials. For industries to achieve the mass production, it is necessary to cut metal bars with high rate. So, it is impossible to depend upon conventional single frame power (electric) hacksaw machine and need the improvement in technology and design of such machines. With the help of this multi way power hacksaw machine the four metal bars can be cut simultaneously to get high cutting rate and to achieve mass production for maximum profit in related company. As the machine overcomes all limitations and drawbacks of conventional hacksaw machine, it is also helpful for small scale industries due to its simple working and operating conditions along with its compatibility, efficiency and affordable price.

Traditionally the work pieces are cut by manually. But using the motor, four hacksaws can operate at a same time. The advantages of four way hacksaw machine are,

- Time saving as compared to simple hacksaw.
- Easy machinery used.
- Multi task can be done in very short time.
- Four work pieces can cut by single person.
- It reduces labour men.
- It reduces labour cost.

1.1 PROBLEM IDENTIFICATION

In current Industrial Processes, material cutting with single hacksaw blade is done in both pneumatic & electrically operated hacksaw machines, because of this machine have more cutting time per unit work piece and more machine time per unit. In current practices, industries have more focus on high material production rate with minimum amount of consumption of available resources. The four-way power hacksaw machine will make improvement on these factors by reducing the material cutting time per unit to the view of increasing production.

1.2 PROBLEM DEFINITION

To done cutting of different materials with higher rating and improvement in accuracy on account of minimization of machine idle time. To decrease the production work time and increase the rate.

1.3 OBJECTIVES

- By using dual scotch yoke mechanism, we can operate four hacksaw machines at same time.
- Use of the total energy of motor so that in minimum time and minimum cost, we can do the work
- The objective of this project is to save man power and time in cutting materials in order to achieve high productivity.
- The main objective of this project is to reduce the human effort for machining various materials.

II. LITERATURE REVIEW

[1] Tanuj Joshi et al [2018] stated that ordinary hacksaw machine can be supplanted with programmed twofold hacksaw machine. Programmed twofold hacksaw machine gives high efficiency in brief era in examination with the regular hacksaw machines. The real favourable position of this machine is that intercession of work is diminished to greatest level. In this fast-

FABRICATION OF PNEUMATIC STOCK-STILLING MACHINE

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Abstract : The pneumatic system has gained a large amount of importance in last few decades. This importance is due to its accuracy and cost. This convenience in operating the pneumatic system has made us to design and fabricate this unit as or project. This unit, as we hope that it can be operated easily with semi skilled operators. The pneumatic press tool has an advantage of working in low pressure, that is even a pressure of 6 bar is enough for operating the unit. The pressurized air passing through the tubes to the cylinder, forces the piston out whose power through the linkage is transmitted to the punch. The work piece thus got is for required dimensions and the piece can be collected through the land clearance provided in the die. The die used in this is fixed such that the die of required shape can be used according to the requirement. This enable different type punch dies resulting in a wide range of products. Different types of punch as requirement can be thus got. According to the work material the operating pressure can be varied. This project work deals with the design of pneumatically controlled three axis punching machine to carry out piercing operation on thin sheets (1-2 mm) of different material (like aluminium and plastic). Reduction in punching force requirement being the main aim of this project work is obtained by modification in punch tool design i.e. by provision of shear on punch face. Subsequently it results in reduction in amount of punching force requirement.

IndexTerms - pneumatic, pressurized air, stock stilling

I. INTRODUCTION

A pneumatic stock stilling machine can be thought of as a large flexible mechanical structure that is moved by some sort of control system. The control system takes its input from a human operator and translates this command into the motion of actuators, which move the mechanical structure. The high performance and highly powerful, Pneumatic riveting machine vice with the capacity for high volumes of punching has done. Punching is a operation of producing permanent impression over a job, it historical day it is done by hammering, where nowadays it is done pneumatic machine with accessories.
One form of inefficiency in current systems is due to the link between the flows of the two ports of the cylinder. This is because most valves use a single spool to control the flow in both ports. Because of this link, it is impossible to set the pressure levels in the two sides of the cylinder independently.
Therefore, the outlet side will develop a backpressure, which acts in opposition to the direction of travel, which increases the pressure required on the inlet side to maintain motion. Since the force generated by the actuator is proportional to the pressure difference between the two sides, the actual pressures in the cylinder don't affect the action of the cylinder.

1. PNEUMATICS

Pneumatics is that branch of technology, which deals with the study and application of use of pressurized air to affect mechanical motion.
The compressed air is used as the working medium, normally at a pressure of 6-8bars (also can be extended up to 15bar) and a maximum force up to 50KN can be obtained .Stock-stilling is used extensively in industry as well as in many everyday applications. It has many distinct advantages in terms of energy consumption, cost and safety. Stock-stilling power is used in industry, where factory machines are commonly plumbed for compressed air (other compressed inert gases can also be used). Pneumatics also has applications in dentistry, construction, mining, and other areas

1.2 Applications of Stock-Stilling:

- Used in small scale industries.
- It can be used as machine with fixed mounting and as a portable machine because it is flexible to move.
- For performing the operations in huge numbers which cannot be done in ordinary machines, Since it's portable.

Literature Review:

A.S. Aditya Polapragada & K. Sri Varsha et al. stated that, Pneumatic systems used in industry are commonly powered by compressed air or compressed inert gases. A centrally located and electrically powered compressor powers cylinders, air motors, and other pneumatic devices.
A pneumatic system controlled through manual or automatic solenoid valves is selected when it provides a lower cost, more flexible, or safer alternative to electric motors and actuators.

DESIGN, ANALYSIS OF LEAF SPRING AND COMPARISON BETWEEN MATERIALS USING ANSYS

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Abstract: *Leaf springs are the one of the oldest suspension components they are still frequently used, especially in commercial vehicles. The automobile industry has shown the increased interest to replace the steel leaf spring with another, since the materials taken are aluminium alloy (5456) composite and silicon carbide. Since the materials have the high strength to weight ratio, good corrosive resistance and structural properties. this work carried out on the replacement of rectangular leaf spring with the leaf spring with trapezoidal per leaf. In this we have selected trapezoidal shape instead of rectangular, and materials of aluminium alloy and silicon carbide is used against conventional steel. A spring with constant width and thickness is designed using solid works, the numerical analysis is carried via finite element analysis using Ansys software. The static analysis is done on the trapezoidal leaf spring using Ansys and comparision of stresses, deflection of the spring and strain energy results for both Al alloy and Sic, are done.*

Index Terms **- TRAPEZOIDAL LEAF SPRING, SOLID WORKS, ANSYS**

I. INTRODUCTION

A spring is defined as an elastic body whose function is to distort when loaded and to recovers its original shape when the load is removed. Originally Leaf spring called laminated or carriage spring, a leaf spring is a simple form of spring, commonly used for the suspension in wheeled vehicles. Leaf springs are mainly used in suspension systems to absorb shock loads in automobiles like light motor vehicles, heavy duty trucks and in rail systems

A leaf spring can either be attached directly to the frame at both ends or attached directly at one end, usually the front, with the other end attached through a shackle, a short swinging arm. The shackle takes up the tendency of the leaf spring to elongate when compressed and thus makes for softer springiness. The springs are initially cambered. More cambered leaf springs are having high stiffness, so that provides hard suspension. Use of longer springs gives a soft suspension, because when length increases the softness increases. Generally rear springs are kept longer than the front springs

principle of leaf spring:

The suspension leaf spring is one of the potential items for weight reduction in automobile as it accounts for ten to twenty percent of the unsprung weight. The introduction of composites helps in designing a better suspension system with better ride quality if it can be achieved without much increase in cost and decrease in quality and reliability. In the design of springs, strain energy becomes the major factor. The relationship of the specific strain energy can be expressed as $U = \frac{\sigma^2}{P\varepsilon}$

Where the σ is strength ρ is the density and E is the Young's Modulus.

2. LITERATURE RIVIEW

D.V Ramana Reddy, B Subbaratnam, E Manoj Kumar et. al.: studied on Composite leaf spring has been carried out in this present work. Comparison has been made between composite and steel leaf springs under the same load conditions. The Stress, displacement and weight have been calculated analytically and compared with FEA results. The results obtained from the Ansys and theoretical values, it has been concluded that all the composite leaf springs have better displacement, stresses and weight compared to the conventional steel leaf springs. The materials selected are Epoxy glass, Epoxy carbon, Aluminum Alloy, Titanium Alloy is used against conventional steel leaf spring. The leaf spring was modeled in CATIA and the analysis was done in ANSYS software.

Anjish M George, Sarath das et. al. : Studied on design and analysis of leaf spring by using hybrid composite material. In This research work provides comparative analysis between conventional steel, and E-Glass/Flax/Epoxy based hybrid composite leaf spring. The hybrid composite leaf spring is found to have lesser stresses and negligible higher deflection as compared to conventional steel leaf spring. Weight can be reduced by 88.49% if steel leaf spring is replaced by E- glass/Flax/Epoxy hybrid composite leaf spring. Weight reduction reduces the fuel consumption of the vehicle. The leaf spring was modelled in CATIA and analysis is done by using ANSYS 15.O software.

Dev Dutt Dwivedi, V K Jain et. al. : Studied on automobile leaf spring by using ANSYS 14.5 Results states that composite leaf spring deflection for a particular load is less compared to conventional leaf spring. Stress generated in the E-Glass/Epoxy leaf spring

FLUID FLOW CHARACTERISTICS AND THERMAL CONDUCTIVE HEAT FLUXES OF CONTINUOUS CASTING BY COMSOL MULTIPHYSICS

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ABSTRACT

Digital analysis of components, in particular is important when developing new products or optimizing designs. Through this project, using COMSOL Multi-physics software helps to understand a concept of continuous casting. In Continuous Casting of steel is an operation which is sensitive to a number of factors. It should be performed with great control and steadiness in such a way to produce safe casting operation and sound steel mechanical properties, and ensure a continuous process with limited delays.

In this study, effects of factors encountered in the process of continuous casting of steel billets on the thickness of solidified steel layer in the mould area and temperature distribution occurs in mould. Casting rates in terms of velocity magnitude and thermal heat conductive fluxes. Of these factors modelled are mould thickness, mould material, thermal conductivity and molten steel superheat. Simplified calculation were performed in which heat transfer equations governing the process solidification were solved using an explicit method of finite difference technique. The results showed that the most effective factor on solidified steel thickness in the mould is the magnitude of molten steel superheat prior to entering the mould.

Key words: COMSOL Multi-physics, Continuous Casting, Explicit method, Thermal heat conductive fluxes

1.INTRODUCTION:

CASTING: It is a manufacturing process by which liquid metal is poured in a mould cavity of a desired shape and remains to get solidified to room temperature. Sand casting., Parmentmould casting , Centrifugal casting , Investment casting and Continuous casting are the different types of casting process.

Continuous casting: Continuous casting, also called strand casting, is the process is shown in Fig.1, whereby molten metal is solidified into a "semi-finished" billet, bloom, or slab for subsequent rolling in the finishing mills. It allows lower-cost production of metal sections with better quality, due to the inherently lower costs of continuous, standardized production of a product, as well as providing increased control over the process through automation.

THERMAL AND MECHANICAL ANALYSIS OF SQUARE HONEYCOMB PLATE FILLED WITH AIR

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***Abstract*:** Heat conduction is mainly due to molecular momentum transfer due to which solids conduct more heat than liquids and gases. Solids with high porous nature cannot conduct more heat because of air gaps present in the high porous solid. In this paper a square honeycomb sandwiched plate was studied numerically to evaluate its thermal and mechanical properties with the help of ansys software. Square honey comb structure has more section modulus. In general structures with high section modulus are subjected to high load applications because they reduce the weight of final component with slight change in maximum equivalent stress (von-mises stress). The square honey comb sandwiched plate is analysed numerically and the results are compared with the solid plate of same projection area of cross section and made of same material. From the results of mechanical analysis, it shows that the square honeycomb sandwiched plate producing more deformation than the solid plate at same applied load and boundary conditions but results from thermal analysis shows that there is a decrease in 18% of heat transfer through the square honey comb plate.

Keywords: **Porosity, Section Modulus, Square honeycomb sandwiched plate, Maximum Equivalent stress (von-mises stress), Heat conduction.**

1. INTRODUCTION:

According to theory of bending, the following equation is applicable for the structures subjected to bending moment:

$$\frac{M}{I}=\frac{F}{Y}=\frac{E}{R}$$

Here M is bending moment acting on structure
I is the moment of inertia of cross section of the structure
F is bending stress developed in the structure
Y is the distance of fiber from neutral fiber
E is young's modulus of the structure
R is the radius of bending deformation

From the above equation

$$F=\frac{MY}{I}$$

$$=> F=\frac{M}{Z}$$

Here Z is called as section modulus and it is directly proportional to moment of inertia of the cross section.

Square honeycomb plate is basically having more section modulus and it can be employed for developing thermal resistive surfaces[1] because it having less solid mass when compared with the solid plate of same thickness and projection area of cross-section. Author Guo cai in his paper he developed a multifunctional composite square honeycomb sandwich structure (MCHSS) which provides both high thermal conductivity and adequate mechanical property for a thermal management system and his studies concluded that MCHSS is used as a promising structure in high end heat dissipation applications [2]. Periodic lattice materials are considered as the most optimistic multipurpose structural materials in this present scenario, and excelled by Ashby, Evans, Fleck, Gibson, Hutchinson and Wadley, due to their exceptional mechanical properties (specific strength & stiffness) and their potential in multipurpose applications [3-7]. It was concluded that composite square honeycomb sandwich panels [8] have significantly more shear and compressive strength than the other types of sandwich panels for constant mass

DESIGN AND ANALYSIS OF OVAL-TUBE HEAT EXCHANGER BY USING ANSYS V15.0 AND COMPARING WITH CIRCULAR-TUBE

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Abstract: Heat exchanger is a device which is used for efficient heat transfer from one medium to another in order to carry and process energy. In this device, one medium is cooled while the other is heated. Generally all the heat exchangers have circular tubes with segmental baffles. Circular tube has less surface area contact than oval tube according to the fluid flow on it. Circular tube does not have aerodynamic configuration and increases total drag forces of fluid. In this project, design and analysis are done for oval tube heat exchanger with different orientation of oval tube to overcome these problems. So, we would like to modify the tube cross-section with elliptical profile for better heat exchange. It also increases the overall efficiency, heat transfer rate and smooth flow in the heat exchanger. The design of elliptical-tube is based upon the circular tube dimensions at equal fluid flow rate. These can be used in power plants as oil coolers with better performance. Modeling is done by using Catia-v5 or Solid-works-v18 and fluid flow and thermal analysis are carried out in Ansys-v15.0 software.

Keywords – **ELLIPTICAL TUBE, SHELL AND TUBE HEAT EXCHANGER & ANSYS.**

1.INTRODUCTION

A heat exchanger is a device used to transfer heat between two or more fluids. The fluids can be single or two phase and, depending on the exchanger type, may be separated or in direct contact. Devices involving energy sources such as nuclear fuel pins or fired heaters are not normally regarded as heat exchangers although many of the principles involved in their design are the same. In order to discuss heat exchangers it is necessary to provide some form of categorization.

Shell and Tube Exchangers:

A Shell and Tube Exchanger consists of a number of tubes mounted inside a cylindrical shell. Figure 8 illustrates a typical unit that may be found in a petrochemical plant. Two fluids can exchange heat, one fluid flows over the outside of the tubes while the second fluid flows through the tubes. The fluids can be single or two phase and can flow in a parallel or a cross/counter flow arrangement. The shell and tube exchanger consists of four major parts:

1. Front end–this is where the fluid enters the tube-side of the exchanger.
2. Rear end–this is where the tube-side fluid leaves the exchanger or where it is returned to the front header in exchangers with multiple tube-side passes.
3. Tube bundle–this comprises of the tubes, tube sheets, baffles and tie rods etc. to hold the bundle together.
4. Shell—this contains the tube bundle.

The popularity of shell and tube exchangers has resulted in a standard being developed for their designation and use by the Tubular Exchanger Manufactures Association (TEMA) Standards [1]. In general shell and tube exchangers are made of metal but for specialist applications (e.g., involving strong acids of pharmaceuticals) other materials such as graphite, plastic and glass may be used. It is also normal for the tubes to be straight but in some cryogenic applications helical or Hampson coils are used.

FABRICATION OF MANUAL RICE TRANSPLATING EQUIPMENT

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Abstract: Agriculture is most important sector of the India economy. It is the most important source of employment for the majority of the work force in the country. Rice is a primary crop cultivated in India. As the large work force is engaged in the sector, traditional method is costly, time consuming and intensive labor work . Timely availability of laborers and water for various activities of rice is becoming a problem. Hence to overcome these issues there is a need of mechanization in the field of rice cultivation by using rice transplanted as major tool in this process. The user friendly rice transplanted for small scale formers in order to increase production as well as quality of rice. A rice transplanted is specialized equipment best fitted to transplanted rice seeding on the wet muddy paddy field. This product is focused on developing a machine which addresses labor problem faced by small scale farmers. The newly developed manual rice transplanting equipment can harvest up to two rows of paddy at a time.

Keywords: – Agriculture, Cultivation, Paddy and Transplanting equipment.

I. INTRODUCTION

India is mainly an agricultural country. Agriculture is the most important occupation for most of the Indian families. In India, agriculture contributes about sixteen percent (16%) of total GDP and ten percent (10%) of total exports. It takes 5,000 liters of water to produce 1 kg of irrigated rice. To plow 1 hectare of land in the traditional way, a farmer and his water buffalo must walk 80 km .Agriculture is the backbone of Indian economy. The rice transplanting machine is a device which is used to plant paddy by using a mechanism. It increases the area that a person can plant when compared to manual transplanting. The final objective is to make a machine that is cost effective so that the small scale farmers can cultivate their farm by cutting the labor costs and time.

II. LITERATURE REVIEW

For initializing this project, we searched different types of information regarding of transplanting field with literature review of different research paper. Our literature review is divided into different field of analysis like Ergo-Economical analysis of different paddy transplanting operation, performance of self-propelled rice transplanter and its effect on crop yield, theoretical development of rice transplanting machine. This study was conducted which gives the parameters, specification, problems arising in already exists transplanter and development & design methodology of transplanter. The unavailability of the rice transplanter in western Maharashtra zone gave the reason to find proper research in this zone and designing transplanter. In this review mechanized rice transplanters in the field of rice cultivation are been discussed by studying various parameters related to transplanter and its field performance. Transplanting essentially refers to the planting of 20- 35 days old and 20-30 cm high seedlings rose in nurseries and uprooted for transplanting either manually or mechanically Mehta et al., (1990). In India rice is mainly cultivated during the Kharif session. In traditional transplantation of rice in the paddy field mostly female workers are indulged.

III COMPONENTS OF MANUAL RICE TRANSPLANTER

1. FOUR BAR LINKAGE:

In this four bar linkage one link is fixed and other three linkages are in motion. The links are connecting rod, lever, crank and planting finger or fork. It is mounted on the driven shaft.

2. CHAIN:

The function of chain is to transmit torque from driver to driven sprockets. The chain is simplex type.The chains are used to transmit the power from hand driving wheel to the shaft in which forks are attached and it is also to transmit the power to the four bar mechanism

DESIGN AND FABRICATION OF ALUMINIUM METAL MATRIX COMPOSITES BY USING STIR CASTING METHOD

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Abstract: Now a days with the modern development, need of advanced engineering materials for various engineering applications goes on increasing. To meet such demands metal matrix composite is one of the reliable sources. Aluminum matrix composites (AMCs) are potential materials for various applications due to their good physical and mechanical properties. So, this project deals with the design and fabrication of Aluminium matrix composite by reinforcing with Aluminium oxide (Al_2O_3) using Stir casting method. The scope of this project is to produce Aluminium matrix composites with low cost which may be the replacement of copper and steel alloys.

***Index Terms*–Aluminium matrix composites (AMCs) , Stir casting.**

I. INTRODUCTION

The engineering fraternity has always been on the lookout for wonder-materials which would fit the bills for all types of service conditions. It stem from the need to make progressive discoveries made by scientists, affordable. This affordability quotient has persuaded many researchers to develop such materials which would satisfy various hitherto unexplored conditions. In today's world almost all generic materials have been tried for various uses and their limitations have been met. But the never ending quest of civilization requires that materials qualify for harsher environments. This unavoidable situation demands that new materials be created from various combinations of other compatible materials. It is to be noted here that this method is not new; it has been with mankind since ages. In every part of the world, various materials have been combined to achieve some intended properties, albeit each case differs from the others, i.e. one can create new materials with unique properties, which can be tailor-made and are different from their base ingredients. This concept holds true for a genre of materials called Composite materials where in, various types of matrices may be combined with reinforcements which contribute to the enhancement of the properties.

II. EXPERIMENTAL DETAILS

The casting unit consists of a graphite crucible of about 5kg capacity, which is heated by electrical resistance type heating coils. The temperature level of the heating unit is controlled by thermocouple activated controlling unit. Duration of heating is determined based on the quantity of material to be melted.

The furnace used in the present work is of bottom pouring type, which is regulated using a valve operated from the bottom. A motor operated stirrer is provided at the top, for mixing the particulate reinforcement with the molten metal. Arrangement is made at the bottom of the crucible for exact positioning of the mould below the valve as shown in Fig 2.1

DESIGN AND ANALYSIS OF MAGNETIC SUSPENSION SYSTEM

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Abstract: This project is based on suspension system of two wheelers which were formally depending upon spring type, hydraulic and pneumatic suspension systems. This report gives information about magnetic suspension system and the magnetic suspension system is turning out to be the new option to these conventional suspension systems. The aim of this project is to study and investigate the response of system, when it is subjected to road surface irregularities with the hope that it would help automobile industry. This project presents design, construction and working of magnetic suspension system. This system uses magnets and spring as passive dampers, which are used to reduce displacement and acceleration of sprung mass in order to improve ride comfort. By using this type of absorber we can absorb the more number of shocks and variations are absorbed with more accuracy. This type of Suspension has no problem of leakage of oil like hydraulic shock absorber. Also this has less maintenance than other types of shock absorber that we can made this type of shock absorber for the efficient work of vehicle and for reducing the maintained cost of vehicle

IndexTerms **- Magnets, Coil Spring, Design Parameter.**

I. INTRODUCTION

Magnetic suspension system is mainly based on the property of magnets that like poles of magnets repel each other. This characteristic of magnets is used for suspension work of system. This system also contains spring in between these two magnets to avoid direct contact of two magnets due to overloading. This system finds large number of applications in automobile industry. In today's world automobile sector has reached its peak. In two wheeler suspensions system used in coil spring is that after some time it becomes not only harder but also reduces cushioning effect. This limitation has overcome by magnetic suspension. The cushioning effect is provided by magnetic suspension is existing for long time. There is one magnet fixed at the top of the inner portion of the cylinder. The second magnet placed at bottom of the inner portion of cylinder that reciprocates up and down due to repulsion. The two magnets fight against each other to achieve the aspect of suspension. Causing the formation of suspension to the vibrations formed in vehicle, which are caused due the road irregularities in order to offer the comfort to both the vehicle assembly and passengers on the vehicle. This system is having the tendency to eliminate the use of conventional suspension system due to its low cost and less maintenance capacity.

We made a model of the Magnetic Shock Absorber which is mainly based on the application of magnetic property like when the same poles of two magnets come in contact with each other then they are repulsed from each other. This unit is mounted in vehicle such as other type of shock absorber. The working of this absorber is very simple. Two magnets are mounted in this way that one is mounted below and other is on upper side. Poles of these magnets are same at inner side so that they are repulsed from each other and space is made between them due to this. When the vehicle is running on the bump or the muddy road then the space between two magnets is reduced and then shocks and variations present in the vehicle absorbed by repulsion property of the magnet. The automobile chassis is mounted on the axles not direct but through form of springs.

Objectives

EFFECT OF ANNEALING AND NORMALIZING ON MECHANICAL PROPERTIES OF FORGED MEDIUM CARBON STEEL

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Abstract: Forging is one of the oldest known metal working processes. Forging is a manufacturing process involving the shaping of metal using localized compressive forces. Forged parts, though required in many engineering sectors, play a vital role in the automotive sector. The majority of the crucial loads bearing structural components as well as safety critical items are processed via the forging route. The mechanical properties such as ductility, toughness, strength, hardness and tensile strength can easily be modified by heat treating the medium carbon steel to suit a particular design purpose. The objective of this work is to establish quantitative knowledge of mechanical properties and correlate with micro structure behavior occurring during the hot working medium carbon steel at the temperature of 1150 c. the process parameters viz., percentage deformation area, heat treatment at different temperature, different cooling medium is investigated.

Key Words: -Medium carbon steel, Austenite, Martensite, Strain hardening parameter.

I. INTRODUCTION

Heat treatment operation is a means of controlled heating and cooling of materials in order to effect changes in their mechanical properties. Heat treatment is also used to increase the strength of materials by altering some certain manufacturability objectives especially after the materials might have undergo major stresses like forging and welding. It was however known that mechanical properties of steel were strongly connected to their microstructure obtained after heat treatments which are performed to achieve good hardened and tensile strength with sufficient ductility. The material modification process modifies the behavior of the steels in a beneficial manner to maximize service life i.e. stress relieving or strength properties e.g. cryogenic treatment or some other desirable properties. The Heat treatment generally is classified into (i) Thermal treatment which consists of softening process: Annealing and Normalizing, hardening process: Hardening and Tempering; (ii) Thermochemical Process which consist of Carburizing, Nitriding, Boronising; (iii) Thermomechanical Processes which consist of mechanical working operation during heat treatment cycle. Though heat treatment is not a new area, it has not been put into effective use in the fact that most of the researchers look at the process in general. It has not been localized for an improvement/modification on getting the required results from these steel materials that are abound in our daily life, especially where most of the steel products are from recycled scrap materials. Hence there is a need to carry out these tests and to be sure of the material compositions before they are put to final use.

Present work is concerned with the effect of forging and heat treatment on the mechanical properties of medium carbon steel with the objective of making sure that the steel is better suited structurally and physically for individual engaging in the design, fabrication and maintenance of steel products.

2.METHODS OF ANALYSES

To evaluate the effect of forged and heat treatment on the medium carbon steel, the investigation was carried out thus;

(i) Preparation of the specimens from 0.30% carbon steel
(ii) Forging the all specimens in two different reduction in area i.e. 50% and 60% reduction
(iii) Heat treating of forged stock (medium carbon steel)
(iv) Different types of tests (Tensile test, hardness, impact test, microstructure) of the medium carbon steel to analyze its Behavior after the forging and treatment.

2.1 Billet cutting:

The 40mm diameter billet of medium carbon steel was cut in 4 pieces for forging as per the following dimensions (1) 105mm length x 40mm dia……2 pieces (for 50% reduction) (2) 84mm length x 40mm dia…….2 pieces (for 60% reduction)

2.2 Deformation during forging:

The different sizes of stocks were heated to forging temperature at 12000C in red hot condition in the muffle furnace. The heated stock have been forged by hammer at different percentage area of reduction like 50%, 60%. The final dimension obtained after forging is as follow. (1) 50% Area of reduction Original size = 40 mm dia × 105 mm length After forging = 29 mm dia × 200 mm length (2) 60%reduction of area Original size = 40 mm dia × 84 mm length After forging = 26 mm dia × 200 mm length

2.3 Heat treatment of forged stock:

From 4 pieces forged stock, 2 pieces one from each percentage reduction has been cooled to room temperature and then stress reliving annealing at 650 0C in the furnace for soaking period of 35 min and then cooled in the furnace itself after switching off the furnace. Now remaining 2 pieces one from each percentage reduction has been normalizing at 550 0C in the furnace for soaking period of 35min and then cooled in the room temperature i.e. in the air.

DESIGN AND ANALYSIS OF COMPOSITE LEAF SPRING BY USING ANSYS V15

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Abstract: — In recent year automobile industries are mostly concentrating on weight reduction and in improving the riding quality. To reduce vehicle weight, three techniques have been studied rationalizing the body structure, utilizing lightweight materials for parts and decreasing the size of the vehicles. In this approach by introducing composite materials into automobile industries, which is having low cost, high strength to weight ratio and excellent corrosive resistance can fulfill the requirement. The suspension leaf spring is one of the potential entities for weight reduction in automobiles as it results in large unstrung mass. The introduction of fiber reinforced plastics (FRP) is used to reduce the weight of the product without any reduction on load carrying capacity and spring rate. As the materials high strain energy storage capacity and high strength-to weight ratio compared to steel, multi-leaf springs are being replaced by mono-leaf FRP spring .FRP springs also have excellent fatigue resistance and durability.

Keywords— leaf spring, composites, CATIA, ANSYS, suspension system

1. INTRODUCTION

A suspension system is one having springs and other devices that insulate the chassis of a vehicle from shocks transmitted through the wheels. The main components of the suspension system are:

- Struts
- Shock absorbers
- Springs
- Tires

The automobile chassis is mounted by the axles, not directly but through some form of springs. This is done to isolate the vehicle body from the road shocks which may be in the form of bounce, pitch, roll or sway. These tendencies give rise to an uncomfortable ride and also cause additional stress in the automobile frame and body. All the part performs the function of isolating the automobile from the road shocks are collectively called a suspension system. It also includes the spring device and various mountings. A suspension system consists of a spring and a damper. The energy of road shock causes the spring to oscillate.

2. LITERATURE SURVEY

Pankaj Sain et.al [2013] studied on design and analysis of composite leaf spring for light vehicles. Main objective of this work is to compare the stresses and weight saving of composite leaf spring with that of steel leaf spring. Here the three materials selected which are glass fiber reinforced polymer (E-glass/epoxy), carbon epoxy and graphite epoxy is used against conventional steel. The design parameters were selected and analyzed with the steel leaf spring from results, they observed the replacement of steel with optimally designed composite leaf spring can provide 92% weight reduction and also the composite leaf spring has lower stresses compared to steel spring. From the static analysis results it is found that there is a maximum displacement of in the steel leaf spring. From the result, among the three composite leaf springs, only graphite/epoxy composite leaf spring has higher stresses than the steel leaf spring. From results it's proved that composite mono leaf spring reduces the weight by 81.22% for E-Glass/Epoxy, 91.95% for

Design & Weight Optimization of a Wheel Rim for Sport Utility Vehicle.

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ABSTRACT. Automobile have various parts which are important for good running of the vehicle. The most important safety components from a structural point of view are the road wheels. They are required to be lighter and more fascinating to the buyer all the time. This implies that it's important to perform a lot of accurate strength assessment on wheel styles. The wheel rim plays a major role in vehicle dynamics. This paper deals with the design and model of different wheel rims based on weight optimization and also structural analysis has been carried out. It has been compared with standard values by varying two different materials. In addition, from the obtained outputs of simulations and the weight optimization, we suggested Aluminium alloys as most suitable material for SUV. Model is created by using SOLIDWORKS software 2015 and structural analysis & weight optimization is done by using ANSYS WORKBENCH 16.0.

1 INTRODUCTION

A sport or suburban utility vehicle (SUV) is similar to a local wagon or estate car, and are usually use with four-wheeled drive for on- and-off road ability, as well as provide additional cargo capacity in the form of a two box design with shared passenger volume with rear cargo access via a lift gate, rather than a separate lower height trunk cargo space with a horizontal lid. The wheel rim is important structural member of vehicle suspension system which supports static as well as dynamic load encountered during vehicle operation. They must design it carefully. Safety and economy are major concern while designing. Also Style, weight, manufacturability and performance are the technical issues related to the design of wheel rim.

Automotive manufacturers are working on developing fuel effective, safe and lightweight vehicle components. In the actual service conditions, finding of mechanical behavior for the wheel is important, but the testing and inspection of the wheels during their development process is time consuming and costly. For economic reasons, it is important to reduce the time spent during the development and testing phase of a new wheel rim. For this purpose, Finite Element Analysis (FEA) is generally used in the design stage of product development to investigate the mechanical performance of prototype designs. FEA simulation of the wheel rim can significantly reduce the time and cost required to finalize the wheel design.

T. Siva Prasad et al [1] worked with the wheel rim designed by using modeling software CATIAv5r18. Later this CATIA model is imported to ANSY'S for analysis work. ANSYS static analysis work is carried out by considered two different materials namely Aluminum and forged steel and their relative performances have been observed respectively. Sourav Das et al [2] carried the design of Aluminum alloy wheel for automobile application which is carried out paying special reference to optimization of the mass of the wheel.

S. Ganesh et al [3] described parametric model is designed for Alloy wheel used in four wheelers by collecting data from reverse engineering process from existing model. P. Meghashyam et al [4] described static analysis work by considering two different materials namely Aluminum and forged steel and their relative performances have been observe respectively by using ANSY'S Software.

P. Ramamurthy Raju et al [5] concerning with generation of S–N curve for Aluminum alloy (Al) A356.2-T6 and estimation of fatigue life under radial fatigue load. The S–N curve is generated by conducting different tests at different stress levels under constant amplitude loading.

From the above mentioned references, we observed that there is a need to reduce weight of wheel rim and also it should contain high strength. For that reason, we used Topology optimization tool in Ansy's Workbench to find the unnecessary region based on that by changing the design, we optimized the mass of wheel rim by using strength calculations and analyzing the rim using Ansy's Simulation software, finally from the results of structural analysis and the weight optimization, we suggest a suitable material of wheel rim for SUV.

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FOUR WHEEL STEERING MECHANISM USING WIRELESS JOYSTICK CONTROL SYSTEM

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ABSTRACT

The front-to-rear wheel alignment plays a significant role in the directional stability of a vehicle. Often the lack of stability causes a dangerous drive. This is clearly observed when a car has worn suspension bushes.

Fourwheel steering is a method developed in automobile industry for the effective turning of the vehicle and to increase the maneuverability. In a typical front wheel steering system, the rear wheels do not turn in the direction of the curve and thus curb on the efficiency of the steering. In four wheels steering the rear wheels turn with the front wheels thus increasing the efficiency of the vehicle. The direction of steering the rear wheels relative to the front wheels depends on the operating conditions.

In standard 2 Wheel Steering System, the rear set of wheels are always directed forward and do not play an active role in controlling the steering. While in 4 Wheel

Steering System, the rear wheels do play an active role for steering, which can be guided at high as well as low speeds. Also in situations like low speed cornering, vehicle parking and driving in city conditions with heavy traffic in tight spaces, driving would be very difficult due to a sedan's larger wheelbase and track width.

INTRODUCTION ;

Four wheel steering is a method developed in auomobile industry for the effective turning of the vehicle and to increase the maneuverability. In a typical front wheel steering system the rear wheels do not turn in the direction of the curve and thus curb on the efficiency of the steering. In four wheels steering the rear wheels turn with the front wheels thus increasing the efficiency of the vehicle. The direction of steering the rear wheels relative to the front wheels depends on the operating conditions.

Nowadays, the problem of increased road traffic has made the handling of vehicles even difficult. Thereby there is a need to find an alternative mechanism for easy steering (turning) of the vehicles. At times when a vehicle is in a congested or a narrow area everyone would want to have a better turning response from the vehicle or want the vehicle to move side wards without much or without any forward movement. Here comes the application of a Four wheel steered vehicle. It should not be mistaken to a four wheel drive in which all four wheels of a vehicle are powered. Here, the rear wheels are also bought into action as they are made to engage their movement in accordance to the front wheels in the directions required.

DESIGN AND FABRICATION OF MULTIPURPOSE SOLAR OPERATED KISAN MACHINE

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Abstract: Farmers are the back-bone for every country. Present days ,rapid growth of population has been observed along with that ,requirement of food also increasing as it the necessary to survive, but interest towards farming is reduced among the people due to cost of labour, heavy rate of work, health issues while spraying the fertilizers and chemicals to the crop. So, in order to demolish these problems a flexible sprayer is required which consists of two major motions reciprocator and rotary motions. The range of the spraying can be adjusted with the help of regulator and the aim of the project is to develop a flexible sprayer and to reduce the problems faced by farmer while spraying the fertilizers and chemicals.

In this proposed system, we have designed a IoT based Solar operated Kisan The aim of this project work is to develop and modernized process for spraying system; hence it is widely used in all farms because it is easy to use and operate.

Keywords – **Fertilizers, Flexible Spraying system. Microcontroller, Node MCU, Motor driver, Pump.**

I.INTRODU CTION:

The applications of pesticides using spraying equipment are play an important role. The chemicals are widely used for increasing agricultural production through better insect and pest management. Spraying is one of the most effective and efficient technique for applying small quantity of liquid1through fine droplets to protect the crops. In India, many versions of hand operated and power operated spraying equipment's are being used. At present, the farmers generally using all kinds of manually operated knapsack sprayer which can cover 0.4 ha/hr and motorized sprayer can cover 1.2-1.6 ha/hr for spraying of pesticides on crops like cotton, red gram. Farmers are facing the problem of coverage of large area within a short period of time as the pest attack is serious problem and spreads quickly.

In the market, different versions of tractor operated or bullock operated sprayers are available, many of the farmers generally spray 6-8 times in a season using manually operated or motorized sprayer to cover large area within a short period of time. Modern spraying technique will improve the operators comfort, safety and spraying effectiveness which would go a long way in increasing crop yield.

Generally the power required for spraying is met out from either alone or combination of human source and mechanical power viz., either petrol engine or dual fuel engines for operating the pump. Sometimes the batteries are used for running the motor which operates the pump for discharging the chemicals. But these batteries require electricity for charging them. However, due to rapid rise in the price of fossil fuels and their limited availability, there is now greater awareness of the need for development of renewable energy gadgets, which is the need of the hour. Because of inadequate supply of electricity, there is a frequent power cut and this situation is shill worse in the rural areas. Hence, there is a greater scope for utilization of solar energy for generation of electricity using solar photovoltaic cells and further to utilize the same for spraying, water pumping, lighting etc.

In this project Blynk app is used to control the movements of the bot. Blynk is a Platform with iOS and Android apps to control Microcontroller, Arduino, Raspberry Pi and the likes over the Internet. It's a digital dashboard where you can build a graphic interface for your project by simply dragging and dropping widgets. It's really simple to set everything up and you'll start tinkering in less than 5 mins.

Blynk it is a supporting application of hardware components to work on the internet base by using the node mcu 8266, relay and other iot based things to work as per our requirement.

DESIGN AND IMPLEMENTATION OF LINE FOLLOWING AUTONOMOUS DELIVERY ROBOT

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Abstract : Automated Guided Vehicles are semi-autonomous Robot capable of navigating and deliver goods in the predefined path without human intervention. The Line follower robot's path can be either visible like a black line on a white surface or it can be invisible like a magnetic tape, laser targeted, vision guidance geo-guidance. The robot uses an array of IR-sensors to navigate through the path. After that, the data is transmitted to the Arduino Uno for processing and making the decision accordingly. An ultrasonic sensor is being used to avoid the collision if any object or human comes in the vicinity of the robot.

Index Terms - **Automated guided vehicles (AGV), Magnetic tape, Infrared Ray Sensor, Ultrasonic Sensor**

I. INTRODUCTION

A robot is reprogrammable multi-functional manipulator designed to place goods, parts, tools or specialized device through variable programmed motions for the performance of task. (Robot institute of America) [1]. Automated guided Robots are nothing new to the world of robotics and they have a wide spectrum of the scope of usage in various fields Like material handling robots used in warehouses, Work-in-process movement, Trailer loading, Theme parks, Pharmaceutical, hospitals to automatically deliver medicines to patients at the due time. An AGV can also be called a laser guided vehicle (LGV). In Germany, the technology is also called Fahrerlose Transport system (FTS). AGVs are available in a variety of models and can be used to move products on an assembly line, transport goods throughout a plant or warehouse, and deliver loads [2]. This paper explains about designing and implementing of a line following robot using guided tape method to navigate throughout the college premises to deliver notices and attendances register to different classes autonomous. To avoid collision with humans being and objects an ultrasonic sensor has been used. For better traction and stability 4-wheel drive architecture has been used. Circulating notice throughout the college is a monotonous time taking job for which using such Robot can be used.

II. PARTS AND MODULES

2.1 Arduino Uno

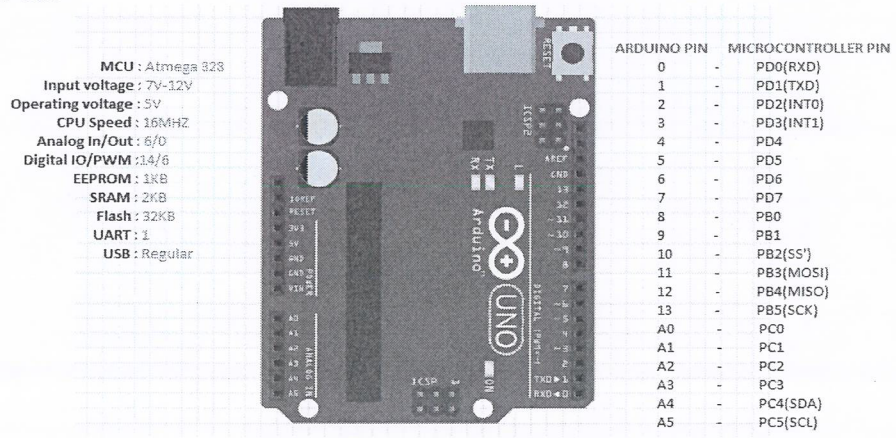

Fig2.1: Arduino Uno R3

It is a single board microcontroller containing ATMEGA328P microchip. It is widely used for making ROBOT prototypes. Coding and interfacing with Arduino are very easy and convenient. The main advantage of using Arduino is, it's completely open sourced each and every detail is provided in datasheet in their official website which makes it easy to customize according to need. Specification and pin diagram are shown in fig 2.1.

PERFORMANCE ANALYSIS & EMISSIONS INVESTIGATION OF DEAD PLASTIC DERIVED OIL BLENDED WITH CRUDE OIL EXTRACTED DIESEL

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Abstract: In recent days the major problem faced in our country is the depleting quantity of conventional fuel, even the quantity of petroleum and crude oil has been utilized more, but there is a lesser production. Due to the increasing utilization of petrol and diesel has paved the way to think people for some alternative way of energy resources. Increase in plastic waste plays a major rising problem against the people of the world. Now current work focused about an issues and efforts are made to get optimum solution. By this dead plastic waste has been converted into plastic pyrolysis oil through pyrolysis process. Dead Plastic oil blended with diesel and it has been used in single cylinder, 4- stroke Variable Compression Ratio engine. Through blending process there is a reduction in the consumption of diesel fuel. The change in the blending ratio of dead plastic oil and diesel fuel has a direct impact on the engine performance as well as exhaust emission data. To understand the change in engine performance, different blends of dead plastic oil and diesel fuel were prepared and test were conducted by running these blends separately in VCR engine with various loads at compression ratios 16 and 17. Blends were prepared for 10%, 20%, 30%, 40% of Dead plastic oil with 90%, 80%, 70%, 60% diesel fuel respectively. Through graphical representation of different performance parameters the effect of engine performance of each blend were compared with diesel fuel.

Index Terms - **Dead plastic oil, Diesel fuel, Blend proportion, Compression ratio, performance, VCR engine**

I INTRODUCTION

With time passing by, the fossil fuel reserves are depleting at a faster rate, causing continuous increase in price of petroleum products all over the world. The high price of petroleum products is a big concern for Indian economy. India imports on an average 80% of total demand of crude oil. It is one of the main reasons of GDP expense. Therefore an alternative cheaper fuel is required to fulfill the needs of common man. Alternative source of fuel lies in plastic. In India 56 lakh tones of plastics are generated each year and only 60% of it is recycled. Safe method of disposing dead plastic has not yet been implemented here, and dumping of dead plastic underground is hazardous to the environment. But we can use it as an alternative source of fuel for gasoline and diesel. This will save the environment from hazardous effect as well as to boosting the Indian economy. In this project we investigated the potential use of Fuel extracted from dead plastic as biodiesel. Various experiments were conducted on Fuel extracted from dead plastic with various blends (P10, P20, P30 and P40) on Variable Compression Ratio (VCR) diesel engine with compression ratio 16 and 17. The results were recorded and compared with the conventional diesel fuel.

II LITERATURE REVIEW

This chapter reviews some of the previous work related to this research work in order to provide background for the subsequent chapters. This main objective is to provide an overview of past and ongoing scientific investigations and modelling related to plastic fuel used in internal combustion engines.

M Ruban, et al studied the properties of the waste plastic fuel is analyzed and compared with the fossil fuel diesel and found that almost it has similar properties to the diesel. The characteristics of the waste plastic fuel is obtained from various studied and summary of the results are the higher heat release rate in waste plastic oil compared with diesel fuel due to better combustion. The Nox increase 40% due to higher heat release rate and combustion and temperature. The CO emission increased 7% in waste plastic oil compared to diesel operation. Unburned hydrocarbon emission is higher by about 15%. Waste plastic fuel exhibits higher thermal efficiency up to 75%. Activated carbon using with this experiment fuel is clean and color is bright yellow. This fuel burns cleaner and burning time is also longer.

Based on the literature survey, it is observed that it is possible to convert waste plastic into liquid waste plastic oil (WPO). But no attempt has been made to use dead plastic oil as a complete alternate fuel in a VCR diesel engine under various operating conditions for its suitability as a fuel in a CI engine. A prototype setup was fabricated and the oil was obtained for the experimentation. The present work focuses on using DWPO as alternative fuel in a variable compression ratio diesel engine in the form of a blend and as a neat fuel at different load conditions.

PRODUCTION OF BIOGAS THROUGH SMART WASTE MANAGEMENT BY CHEMICAL DIGESTERS

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Abstract: The conversion of kitchen waste into naturel energy by adding some chemical digesters. In kitchen waste the organic material of high nutritive and calorific values, the composting or other reuse of bio-degradable waste such as food or garden waste is also considered for recycling. Keep the kitchen waste in, crush containers, and recycle.The digestion of the kitchen waste produces biogas, anaerobic digestion is a microbial process for production of biogas, and Biogas consists of gases like methane and carbon dioxide. And With the help of bio-gas we produce heat and electricity and it can be used as fuel. Biogas can be produced from raw material such as agricultural waste, manure, municipal waste, plant material, sewage, green waste or food source. It can also be used in a gas engine to convert the energy in the gas into electricity and heat. This process is economically cheaper.

Index Terms **- Anaerobic digestion; Biogas; chemical digester; kitchen waste**

I. INTRODUCTION

In our college of engineering there are two individual canteens and both having their own individual mess, our project is to create a biogas which will be eco-friendly, more cost effective. Daily large amount of kitchen waste is obtained from our mess, it can be utilised for better purpose of producing biogas, Biogas can be used as high quality renewable fuel, by placing a biogas reactor on campus, and it will be beneficial. Kitchen waste will be collected from individual messes for the reactor to produce biogas energy. The digestion of the kitchen waste produces biogas, anaerobic digestion is a microbial process for production of biogas, Biogas consists of gases like methane and carbon dioxide, and it can be used as energy source. In kitchen waste the organic material consist of high nutritive value and high calorific value, so the efficiency of methane is high. So the cost of the biogas production is low.

In our country deforestation and pollution was very big problem, most of the people uses charcoal and wood as fuel or to produce energy. It leads to deforestation, it also damages soil erosion, dung and fire wood also leads to pollution by producing smoke, Coal and petrol are also used to produce energy, but they are non-renewable and damages the environment, Renewable energy sources like solar energy, wind energy, thermal energy, hydro source and biogas are all renewable energy resources.

In most cities and places, Kitchen waste is disposed in landfills or discorded which causes the health hazards and diseases like malaria, typhoid. It not only leads to polluting surface and ground water, it further leads to breeding of flies and mosquitoes, rats and other diseases. From this it emits bad smell and methane. It is a major greenhouse gas.

By using cattle dung, municipal solid waste (MSW) or sewage in biogas plants, we can make this system very efficient by using kitchen waste or food waste. Biogas has different characteristics, at the same time organic waste can be used as fertilizer and water for use in Agriculture irrigation. It does not require any advance technology to produce energy, it is very simple to use. We need eco-friendly energy.

1. BIOGAS

BIOGAS: Biogas is a renewable source, like wind energy, solar energy, thermal energy, hydro energy. It is eco-friendly and clean. It is used to produce lighting, heating and generation of electricity and also used as fuel for cooking. Biogas is formed under the condition of anaerobic, this process is known as anaerobic digestion, and the digester would produce fertilizer and methane, biogas consist of some gases like methane (CH4), carbon dioxide (CO2), water (H2O), hydrogen sulphide (H2S), ammonia, nitrogen, oxygen, hydrogen. Biogas can be formed by using the cow manure, buffalo manure, pig manure, kitchen waste, municipal waste, agriculture waste. Biogas is produced under the absence of oxygen.

DESIGN AND FABRICATION OF TRUCK BED ATTACHED WITH CONVEYOR BELT

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Abstract: Conveyor Belts are used for loading and unloading. The systems are designed to move large family of material transport equipment over fixed path. In these project we will design and fabrication of a cargo bed which is the back part of the truck where are the goods are placed. The base part of the cargo bed is made of a conveyor belt where the load will bear. The design of cargo bed will in v-shape so that the load concentration over the conveyor belt will be reduced when compared with u-shaped cargo bed. For the operating of conveyor belts we use low speed and high torque DC Motor. The goods will unload from the truck by using conveyor belts.

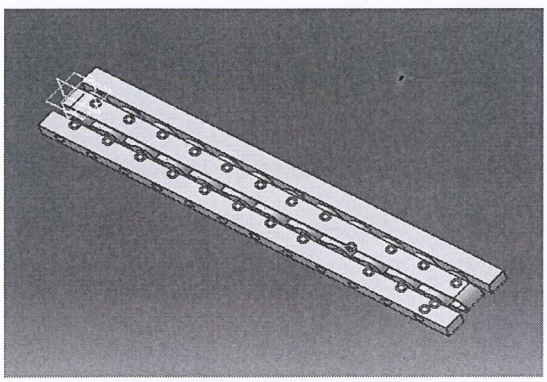
Index Terms **– conveyor belt, cargo bed, concentration, DC motor.**

I. INTRODUCTION

Conveyor is used in many industries to transport goods and materials between stages of a process. Using conveyor systems is a good way to reduce the risks of musculoskeletal injury in tasks or processes that involve manual handling, as they reduce the need for repetitive lifting and carrying. Conveyors are a powerful material handling tool. They offer the opportunity to boost productivity, reduce product handling and damage, and minimize labour required in a manufacturing or distribution facility. All lifting and conveying machines can be divided by their operating principles into two large groups: (i) Intermittent motion, (ii) Continuous motion Intermittent motion includes all types of cranes, lifts; surface transport means (trucks, loaders, prime movers), aerial tramways and cable ways, scrappers and the like. Continuous motion includes conveyors, pneumatic and hydraulic transport means etc. which may generally called continuous transport machines or conveying machines. Continuous machines are characterized by non-stop motion of bulk or unit loads along a given path, without halts for loading and unloading. At the same time they can distribute loads among a number of destination points, deliver them to stores, and transfer products from one technological operation to another and ensure the desired pace of a production process.

II. WORKING

This project is based on rubber conveyor belt. As the pulley moves belt starts to rotate in forward direction. Idlers help in maintaining close contact with the pulley. Material is collected mechanically or manually at other end. Belt then returns again at the point of feeding. Conveyor belts are basically very wide belts attached in a loop to two or more turning rotors driven by motors. The loop is the actual conveyor belt, and is generally made of two or more layers of rubber, one layer to give shape and structure to the belt and one to allow it to transport its load safely. This conveyor loop is generally attached to two wheels, called rotors, which are spun by motors. The conveyor belt has enough friction between it and the rotor that it sticks to this rotor. As a rotor turns, the conveyor belt will turn as well due to the intense friction between the rotor wheel and the belt. This turning motion of the rotor causes one side of the belt to move in one direction, while the other moves in the opposite direction. This means that both wheels must always be moving in relatively the same direction, either clockwise or counter-clockwise. If the two rotor wheels moved in opposite directions, the conveyor belt would not travel at all.



2.1 Working of conveyor belt

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ROOM TEMPERATURE REDUCING ECO COOLER MADE FROM WASTE PLASTIC BOTTLES

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Abstract

Summer is in full swing and many of us are complaining about the heat. But few places reach the scorching temperatures where air conditioning is simply not an option for most people living in rural areas. A clever DIY cooling system that does not require electricity is built from common waste items such as empty plastic bottles. We call it a eco cooling system. The working is based on the principle that when the compressed air expands through the nozzle, the swirl motion is created. The air moves as a free vortex from the nozzle plane towards the valve end. As it reaches near the valve, the kinetic energy is converted into the pressure energy giving a point of stagnation.

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Keywords and phrases: development of artificial cooler, waste bottles, unused cardboard, eco cooler.

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FREE VIBRATION ANALYSIS OF SIMPLY SUPPORTED CIRCULAR COMPOSITE PLATE

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Abstract: Structural components now-a-days are made of the Composites so knowing the fundamental frequencies and vibration response to various excitations for a given boundary function is paramount. The present work involves extensive study to investigate the free vibration analysis of Graphite/Epoxy, Glass/Epoxy & Kevlar/Epoxy composite plates of solid circular form in simply supported boundary condition by using the Bessel functions as admissible functions for the Raleigh-Ritz method. This analytical work is carried out by following the thin plate theory, Hamilton principle is used to obtain the equilibrium equations for the plate. By variable separable Bessel transcendental equations are obtained, the non dimensional frequency parameter, natural frequency of the plate is calculated. Thus, the natural frequencies and its associated mode shapes of the given geometry under proposed boundary condition is obtained. It is observed that the natural frequencies and modes of vibration for graphite/epoxy shows better improvement during first mode under simply supported boundary condition. It is recommended that the graphite/epoxy is best suitable material for dynamic structural applications.

***Index Terms* – composite plate, Natural frequency, Bessel function**

I. INTRODUCTION

Vibration analysis and Composite materials are the two growing research topics. Almost all the structural components subjected to the dynamic loading in their working life cycle and the vibration affects the life of the structure. So it is paramount in designing a structure to know the vibrational response so that necessary preventive steps to control its structural vibrations. Mohammad Amin Rashidifar, Ali Amin Rashidifar [1] has investigated analytically Free and Forced Vibration response for isotropic material of clamped circular geometric plate by using the Bessel functions and Henkel Transformations. Leissa [6] a technical report on plate vibration by Leissa includes the analytical solutions of plates of various shapes. The analytical values of the non dimensionalized frequency parameters for different shapes and boundary conditions were given, based on this report, many other researchers have approached more difficult versions of plate vibration problem. Her, Liu and Lin [3], [4], [5]Parikshit Mehta [8] He investigated analytically free and forced vibration response for aluminum clamped circular geometric plate and membranes by utilizing the Bessel functions. An equilibrium analytical solution is derived using the Hamilton principle and non dimensionalized frequency parameter, natural frequency, deflection of the circular plate is carried out.

II. FREE VIBRATION ANALYSIS OF CIRCULAR COMPOSITE PLATE

Governing equation of motion for the composite circular plate is given in eq. (1)

$$\rho h \frac{\partial^2 w(r,\theta,t)}{\partial t^2} + D_e \nabla^4 w(r,\theta,t) = 0 \tag{1}$$

The differential equations for spatial and temporal variables eq. (2) and eq. (3) is obtained as follows

$$\frac{\partial^2 T}{\partial t^2} + \omega^2 T = 0 \tag{2}$$

$$\nabla^4 w(r,\theta) - \lambda^4 w(r,\theta) = 0 \tag{3}$$

Where,

$$\lambda^4 = \frac{\rho h \omega^2}{D_e} = \frac{\rho h \omega^2}{\left[16\pi^4 D_{12} + 8\pi^2 H_{12} + D_{22}\right]} \tag{4}$$

D_e = Effective bending stiffness

DESIGN AND FABRICATION OF AUTOMATIC AND MANUAL COCONUT DEHUSKING MACHINE

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Abstract: *In coastal areas of India is cultivated and that to coconuts are planted more. The coconuts are dehusked by traditional ways. The coconut husk is used as the coir in Industry, Copra is supposed to eat as food; water is used to drink which contains nutrition. To dehusk the coconuts will take more time by using machete or spine. Then after those dehusking machines which runs by electric motor are invented to dehusk more coconuts. But the spines on the machine will be harmful to hands or any other parts. To overcome the above problems we designed a manual and automatic coconut dehusking machine In this we are using two hollow shaft rollers with spines on them in zigzag way .To avoid the skipping of coconut we are using fixed arm with movable enclosure . The coconut dehusking machine can be operated by rotating the handle which is connected to one of the roller and or it can be operated by using the electric motor by rotating the rollers by means of belt drives.*

Keywords **– Coconut,Dehusking, Spines, Husk, Cylinder, Enclosure.**

1.INTRODU CTION

In many coastal areas the coconuts are the mostly grown fruit. This coconut fruit is used for so many purposes. In Industries the husk is used for making the ropes, door mats, and handicraft. The husk can also be used for the cultivation of mushrooms. The copra of coconut is used in some food industries in making edible oil, mineral oil. The main concept of this project lies in removal of the coconut husk without any obstruction in removing the husk and also without any harmfulness to the operator. Its concept is very simple that is holding and removing. The coconut is placed between the two rollers which have the spikes on their periphery. The encloser will be lowered to avoid the skipping of the coconut from the roller. Then the electric motor drives the roller by means of belt drives which is connected to the pulleys. The two rollers will rotate at different speed that tends to removal of the husk from the coconut fruit

2.LITERATURE REVIEW

H Azmi et.al[1] studied briefly on the need and importance or usefulness of coconut dehusking machine in agricultural based industries. They show the relevance of the fabrication of the dehusking machine in both small scale and large scale industries.Dinanath et.al[2]has been developed the coconut dehusker. The machine is designed to dehusk the husk from the coconut fruit including a plurality of rollers rotating in opposite direction at different speeds. The interaction of the rollers in combination with the gripping of the spike.The spike serves to tear away the husk from the nut in fact Gutte[3]studied briefly on the performance of manually operated coconut dehusker has been developed by Dr.BSKKR.Depoli.It was reported that the capacity of dehusker for dehusking the coconut was 48 coconut per hour. The time requires dehusking a single coconut as 45.24sec.it requires 4 strokes to dehusk the coconut totally. Gajakos et al.[4] has developed a power operated coconut dehusker. It consists of main parts like frame, electric motor speed reduction units and dehusking units. The dehusking units consist of two cylinder viz. dehusking cylinder and idle cylinder. Dehusking cylinder was provided with triangular shape teeth on their periphery,Which on the cylinder penetrated into the husk and pulled ot away from the coconut. Single person was required for operating the dehusker. Kwangwaropas et,al[5]has been improved hydraulically operated coconut dehusking machine. It consists of three main parts such as the frame, the power unit together with hydraulic system, and dehusking mechanism. Two persons were required to work synchronously. One to operate the machine while the other to take out minor remaining fibrous husk from the shell of the dehusked coconut and collects them. Jarimopas et al.[6] has studied physical characteristics of intact and trimmed young coconuts fruits. Number of freshly available coconut fully mature fruit of the, Namhom variety were obtained. Thirty intact and 30 trimmed coconut fruit were randomly selected from three big fruit markets in the Bangkok metropolitan area. The diameter D and height H of each intact fruit were measured using vernier calipers. The physical characteristics of each trimmed fruit sample fruit height h1, shoulder height h2, shoulder diameter ds, base diameter db were measured.

Hamid et al[7]has studied the performance of developed coconut dehusker machine. The machine requires only one operator to feed the coconut into the machine. Hundreds of coconuts from four different types has been tested in the mechanical coconut dehusking machine. The performance of machine in terms of reliability, durability, unconditionality, safety, work rate, cost and efficiency were studied. The efficiency of the machine was tested for four local coconut varieties viz. Malayan tall 92.5 % and 85% for ripened and matured nut respectively, Matag 85%, Mawa 77%, and Yellow dwaft 46%. The machine was capable to dehusks 270-300 nuts/hr or 7-10 sec/nut. The dehusker machine was also found stable, reliable, and durable less maintenance, technically feasible and economically viable. Terdwongworakul et al.[8]has studied the physical properties of freshly available young Thai coconut for maturity sorting. Judging the maturity of young coconut was difficult and thus the harvested crop typically featured fruit of varying levels of maturity, which currently require was manual grading. In an attempt to help reduce the time and costs associated with the grading process, the correlations between the physical, mechanical, physiological and acoustic properties of coconuts and their maturity levels were investigated. Jacob and Kumar et al. [9]has been designed power operated

FABRICATION AND STUDY OF MECHANICAL PROPERTIES OF COMPOSITE NATURAL FIBER

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Abstract : Natural fibers (Sisal, Jute, Banana, Coir) in combination with Epoxy resin has proved to be excellent for making cost effective composite materials. To have the genuine results , the retting process of each fiber has been done by ourselves to obtain the pure form of fibers. Each fiber is sorted to have equal length and assembled properly. They are prepared using pultrusion method. A bunch of fibers are forcibly extruded through the tube and obtained a uniform diameter using pultrusion process. The resin used in the preparation of composites was epoxy in combination with hardener. Fibers were used as reinforcement and epoxy resin is used as matrix in the fabrication process. Fibers and epoxy were hybridized at percentage of 70% and 30%. Samples prepared were tested to evaluate its properties, such as tensile strength, compressive strength, impact strength and hardness. Sisal fiber reinforced epoxy composite exhibited better mechanical properties among the five types of fiber composite specimens.

Key words- Sisal fiber, Banana fiber, Jute fiber, Coir fiber, Mixed fiber, Pultrusion process.

I. INTRODUCTION

A composite is a material made by combining two or more dissimilar materials in such a way that the resultant material is endowed with properties superior to any of its parental ones. Natural fibers have been used to reinforce materials for over last two decades. Fiber-reinforced composites, owing to their superior properties, are usually applied in different fields including door panels, trunk liners, instrument panels, interior roofs, parcel shelves, among other interior components, are already in use in European cars due to the more favorable economic, environmental and social aspects of the vegetable fibers, sports goods, aerospace, engineering applications, defence, house hold appliances, decorative items, safety appliances like industrial helmets, etc,. Recently, they have been involved in combination with different materials. Natural fibers are eco friendly, biodegradable, abundantly available, renewable and cost effective, high strength and have less weight. Natural fibers do not possess any type of health hazard properties and finally, provide a solution to environmental pollution by preparing new composites using natural fibers. Natural fibers have the potential to be used as a replacement for traditional reinforcement materials in composites for applications which requires high strength to weight ratio and further weight reduction. Currently, different types of natural fibers have been investigated for use in plastics including flax, hemp, jute straw, wood, rice husk, wheat, cane (sugar and bamboo), grass, reeds, kenaf, ramie, oil palm empty fruit bunch, sisal, coir, water, hyacinth, pennywort kapok, banana fiber, pineapple leaf fiber. Fibers obtained from the various parts of the plants are known as vegetable fibers. Animals can also provide a source of fibers. A wide variety of properties can be achieved through proper selection of fiber type, fiber orientation and fiber reinforcement form. The mechanical behavior of a natural fiber composite depends on numerous factors. For example, fiber length and quality, matrix, fiber-matrix adhesion bond quality and so forth. A good interface bond is required for effective stress transfer from the matrix to the fiber where by maximum utilization of the fiber strength in the composite is achieved . Modification to the fiber also improves resistance to moisture induced degradation of the interface and the composite properties. Mechanical properties of natural fibers especially flax, hemp, jute, banana and very good. A number of investigations have been conducted on several types of natural fibers such as bamboo, banana and jute to study the effects of these fibers on the mechanical properties of composite materials. Information on the usage of banana fibers in reinforcing polymers is limited in the literature. Development of polymer composites with natural fibers and fillers as a sustainable alternative material for some engineering applications, particularly in aerospace applications and automobile applications are being developed. Natural fibers show superior mechanical properties such as stiffness, flexibility and modulus compared to glass fibers. The main advantages of natural fibers are of low cost, light weight, easy production and friendly to environment. Composite materials are intended to combine desired characteristics of two or more distinct materials. The main benefits of exploitation of natural fibers are: abundance and renewability, low cost, non- abrasiveness, simple process, non-toxicity, high flexibility, acoustic insulation and low density. On the other hand, there are some drawbacks such as their poor mechanical properties and high moisture absorption. The latter is due to their hydrophilic nature that is detrimental to many properties, including dimensional stability. Nevertheless, some composite components (e.g. for the automotive sector), previously manufactured with glass fibers are now produced with natural fibers. It have been observed that the effect of fiber length and weight percentage increases the flexural modulus and impact strength when increase in length of fiber and weight percentage of fiber. The strength of short fiber composites depends on the type of fiber matrix, fiber length, fiber orientation, fiber concentration and the bonding between the fiber and matrix. The results show that the tensile strength, young's modulus and water absorption of polyester composites increased with the increasing polyester content but elongation at break decreased. Morphology studied indicates that the tendency of filler- matrix interaction improved with the increasing filler in polyester matrix.

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Effect of different Waste Materials Addition on the Properties of Clay Bricks

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Abstract: ***The disposal of wastes becomes major problems in the world and effects to environment and becoming toxic. Fly ash is one of the many substances that causes air, water and soil pollution. Along with this some other materials like saw dust, rice husk, bagasse also effects the environment pollution and some disturbances to the human activities. In order to save the precious land and soil from being used in manufacturing building bricks and to save the environment from the waste. In this project, the experiment will be done to know whether these materials addition alters the properties of bricks or not. Based on experimental results such as compressive strength, impact strength, efflorescence test, firing shrinkage, apparent porosity, bulk density, water absorption of different batches were calculated. it was concluded that the bricks with the waste material admixture, gave the good quality.***

Keywords: Clay, ash fly, rice husk, saw dust, bagasse, compressive strength, impact strength, efflorescence test, firing shrinkage, apparent porosity, bulk density, water absorption.

I. INTRODUCTION

Bricks plays a major role in construction industry and disposing some waste materials can lead to pollute the environment directly or indirectly. Some make disturbance to human activity and some becomes toxic to the nature (such as industrial wastes like fly Ash). Hence it becomes crucial to reuse the vast amount of different waste materials. A lot of research has been done on recycling the waste products in our daily experiences. This project conducted to save the precious land and soil from waste materials by being used in manufacturing building bricks and to save the environment from the waste.

Surender Malik et al (2015) prepared 3 types of bricks the former one in 100% Clay, second one is a mixture of 5% Fly Ash in clay (95% Clay+5% Fly ash) and another as 5% mixture of rice husk ash in clay(95% + 5%) in six samples of each and conducted compressive strength test on compression testing machine and water absorption test, results as fly ash content brick gives more compressive strength than conventional clay bricks and less water absorption nature. Rice husk ash brick results more water absorption in nature but with stands less compressive strength. Clay brick had high specific gravity than remain bricks containing rice husk ash and fly ash. [1]

David N Githinji et al (2015)study states that clay bricks were fabricated using different proportions of sawdust and polystyrene material,it results increase in non-clay material tends to decrease the properties like compressive strength, bulk density and flexural strength and also increase some properties like porosity and water absorption capacity. Particle Image Velocimetry (PIV) method is used to observe the surface deformation under uniaxial loading and made a stress strain curve pure-clay bricks to exhibit brittle failure to be as result of strong bonding between clay particles. [2]

Utsarga Choudhury (2013) prepared bricks using industrial major waste fly ash as admixture to clay with different compositions and conduct various tests to make various measurements like Rolling limit, Drying shrinkage, Firing shrinkage, Apparent porosity, Bulk density, Water absorption, And states that increase in fly ash content in composition increases the rolling limit and bulk density and decreses properties like firing shrinkage, drying shrinkage, absorption and apparent porosity. [3]

Haili Cheng et al (2016) fabricate bricks from waste and broken clay bricks which are rejected in quality control depertment by inspection methods and some of waste bricks from building which are collapsed, and results are not best compared to normal fabricated bricks because thermal stresses are increased while firing the bricks and tends to cracks in bricks and alkali nature gets increased which increses efflorescence of bricks it effects the wall by forming white or gary layer. [4]

Kedsarin pimraksa et al (2001) prepared bricks with 100% fly ash but of different grades as sieved –63+40 μm fly ash and sieved –40 μm fly ash in different proportions, it results very high compressive strength and bending strength as 56.3Mpa and 13.1Mpa respectively and does not losses weight after firing not more than 4% so it made firing easy. Due to there is zero percentage of clay

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Heat Transfer Phenomenon of Fluids in Corrugated Plate Heat Exchangers

D.Anjibabu, Shaik Nayeem

Abstract: Heat transfer is great attention in every Industrial application. While designing the heat exchanger two important factors are must be considered one is the least amount of pumping power (minimum Pressure drop) and most efficient heat transfer for given conditions. The configuration of heat Exchangers is extent effects on the above two factors. The corrugated heat exchanger comes under special type of heat exchangers .This type heat exchanger recover more heat than the other type of heat Exchangers because of they are arranged to form a package due to this is compact form of heat having less weight, and less space and providing high heat transfer coefficients than the other types. The heat transfer coefficient and friction factor of water,water+sio$_2$ are determined for flow under corrugated heat exchanger at corrugation angles of30°,40°,50°.Experiments are under taken laminar flow region at bulk temperature of 60° c. The experimental results shows that enhance in Reynolds number causes increase in heat transfer coefficient and 50°corrugated angle gives optimum result due to high turbulence created at low velocities.

Keywords: Corrugated heat exchanger, heat transfer coefficient, Reynolds number, nano particles.

I. INTRODUCTION:

For Energy saving many types of heat exchangers are now available. Heat exchangers can be used many applications relating high heat transfer performance. Corrugated plate heat exchanger are belongs to this category. They are capable of recovering heat efficiently even at low temperature difference mainly because of high turbulence created at low velocity. The corrugated plate heat Exchanger process may unique characteristics of great Significance to Industrial applications. These type of heat exchanger can with stand up to 250^0 and pressure range of 2MPA and made of variety of materials like stainless steel, nickel&nickelalloys, copper and titanium etc depending upon the operations temperature and pressures.The nano particles mixed in conventional fluids may leads to considerable increasing heat transfer coefficient. The nano particle consists of good physical and chemical properties it include high heat transfer rate, better mechanical permanence and higher thermal conductivity because of wide surface area and scaled nano size. The- better heat transfer obtained at minimum spacing .The experiment conducted at three different spacing at 6-mm, 9mm, 12mm .For this purpose 20 parallel plates are arranged with total heat transfer of $1.1629m^2$ [1].

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The heat transfer performance of the corrugated plate heat exchanger is done by using the Buckingham Pi -theorem. The experimental results are contrast with the correlation to recognize flow characteristics and geometry parameters which affect the heat transfer rate [2].Increase in channel spacing and its phase shift angle in corrugated heat exchanger will cause the increase in friction factor. Results are compared with the parallel plates the mean heat transfer coefficient and pressure drop increases from 2.6 to 3.2 and 1.9 to 2.6[3]. CFD code is used for measurement of heat transfer performance of a cross corrugated heat exchanger. Network of resistance method is used for to find out the longitudinal heat conduction effect. This method widely used for heat exchangers design [4].For the experimental purpose two different size of nanoparticles are consider that is 36nm and 47nm .Experimental results shows that the addition of nanoparticles into conventional fluids has produced a considerable enhancement of the heat transfer coefficient that clearly indicates increases with the nanoparticle concentration. Heat transfer coefficient is higher for 36nm [5]. Heat exchanger consists of ARMFIELDFT-43 with flat plate arrangement. The estimated results are compared with those obtained from usual method of single pass arrangements [6]. The rate of heat transfer in corrugated plate heat exchangers is higher as compared smooth tube under at turbulent fluid flow region of Reynolds number 5500 to 60000 by water is used as a working fluid. Heat transfer rate increases due to the increase in heat capacity ratio, flow arrangement, number of channels used and relationship between the heat transfer performances [7]. Theoretical results are compare with experimental results. By changing geometric parameters like aspect ratio, hydraulic diameters are used for calculation of convective coefficients this results are compare with experimental ones [8]. Under constant temperature range the convective heat transfer coefficient and friction factor of TiO_2/ water and SiO_2/water nanofluids are determined at turbulent flow filed of Reynolds number ranging from 5000 to 25000 and for volume concentrations ratio up to 3.0% [9]. They development of three different type sections that are offset fin, wavy fin and non-uniformity characteristics of the inlet fluid flow. For experimental purpose air is used as a working fluid. Better results obtained for wavy fin characteristics [10]. The angular cut wavy tape inserts with wave ratio and different inlet velocity. By using angular wavy tape leads increase in heat transfer as compared to no angular cut wavy tape. This type particularly useful in solar preheaters and heat exchangers [11]. Commercial code fluent is used for flow visualization. Secondary flows inside wavy duct causes pressure drop will be in more in those that of the smooth circular duct and the Reynolds number increases with the average mass transfer [12-13].

II. THE EXPERIMENTAL SETUP:

MECHANICAL-A · (BATCH NO-15)

FABRICATION OF DUAL ACTING CAN CRUSHER

(30)

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Abstract: Now a days, recycling is rapidly increasing day to day. The amount of wastes coming out is increasing in tremendous quantity. Aluminium cans and tin plates cans are one of the important products. That why we choose this project is about fabrication of double acting can crushing machine. It is a mechanical can crusher to help the people to crush the cans easily. Normally in single acting crushing machine the required work (crush) is done one time only at a rotation of crank. But, in the double acting crushing machine the work (crush) is done two times at a rotation of cycle. When the rotary motion from the motor is converted into reciprocating motion by the crank which is in turn connecting to the piston that crushes materials.

Keywords: Aluminium can, Can crusher, Slider crank mechanism.

I. INTRODUCTION

The main purpose of the project is to get knowledge of the fabrication of the double acting can crushing machine. Aluminum can recycling is the process by which scrap aluminum can be reused in products after its initial production. The process involves simply re-melting the metal, which is far less expensive and energy intensive than creating new aluminum through electrolysis of aluminum which must first be mined from bauxite ore and then refined using the Bayer process. Since cans are best way to preserve food therefore there use in preservation of food is in creating day by day. The other fact is that these cans can be recycled easily and does not affect the environment like politeness. But at the time of waste handling and its transportation these cans must occupy minimum space or possible so as to store and transport them in large quantity and here comes our can crusher.

II. SLIDER CRANK MECHANISM

It is a arrangement of mechanical parts designed to convert straight-line motion to rotary motion, as in a reciprocating piston engine, or to convert rotary motion to straight-line motion, as in a reciprocating piston pump. The slider-crank mechanism is a particular four-bar linkage configuration that exhibits both linear and rotational motion simultaneously. This mechanism is frequently utilized in undergraduate engineering courses to investigate machine kinematics and resulting dynamic forces. The position, velocity, acceleration and shaking forces generated by a slider-crank mechanism during operation can be determined analytically. Certain factors are often neglected from analytical calculations, causing results to differ from experimental data. The study of these slight variances produces useful insight. The following report details the successful design, fabrication and testing of a pneumatically powered slider crank mechanism for the purpose of classroom demonstration and experimentation. Transducers mounted to the mechanism record kinematic and dynamic force data during operation, which can then be compared to analytical values. The mechanism is capable of operating in balanced and unbalanced configurations so that the magnitude of shaking forces can be compared. The engine was successfully manufactured and operates as intended. Data recorded by the device's accelerometers is comparable to calculated values of acceleration and shaking force.

III. COMPONENTS OF CAN CRUSHER AND CONSTRUCTION

1. Base frame:

Base frames are used to support mechanical equipment and provide rigid platforms for attachment of vibration isolators, without allowing excessive differential movement between driving and driven members. The bases provide a means by which the equipment can be stabilized and motion reduced by lowering the equipment center of gravity.

2. Connecting rod:

A connecting rod is a rigid member which connects a piston to a crank or crankshaft in a reciprocating engine. Together with the crank, it forms a simple mechanism that converts reciprocating motion into rotating motion.

3. DC motor:

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic; to periodically change the direction of current flow in part of the motor.

4. Bolts and Nuts:

Bolts and nuts are used in several applications, with a primary function to hold things or components together. A bolt, also known as a screw, does not always have to be used together with a nut; however, a nut is always used together with a bolt. Nuts and bolts serve as the fundamental components in several construction projects as they provide strong bonds that do not break even under great amounts of pressure.

FLOOR CLEANING ROBOT WITH DUAL ROTATING BRUSHES AND ANDROID APP BASED CONTROL

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Abstract : Households of today are becoming smarter and more automated. Home automation delivers convenience and creates more time for people. Domestic robots are entering the homes and people's daily lives, but it is yet a relatively new and immature market. However, a growth is predicted and the adoption of domestic robots is evolving. In this proposed system, we have designed a Bluetooth based Wireless Floor Cleaning Robot with Dual Brush cleaning mechanism.

IndexTerms - **Microcontroller, Bluetooth module, Motor driver, Relay, LCD Screen.**

I. INTRODUCTION

Robot is an intelligent device having its own brain fed with computer logic so that it can do the work according to the algorithm designed. Autonomous movement of vehicle is guided by the logic controller designed. Robots plays an important role in each every field of life. It is used in industries, in households and in institutes. The robots are just becoming as intelligent as human now a days. Mostly an average human uses 2-3 robots per day in his day to day life.

Mechanical control devices are used to control the flow or movement of materials or any other parts present in the device. Actuators are used for controlling a mechanism which ultimately controls a part of the device. Microcontroller is the brain of robot where program is written and sensors are connected as input and actuators as output. The controlling of the robot is governed by various algorithms like fuzzy controller, machine learning based practices and artificial neural network based algorithms. Depending upon the environment value received to the controller it eliminates the error and transits from one state to another.

The research and development of an autonomous mobile robot and a Manual Phone Application Control prototype able to clean a room or even an entire house is not a trivial challenge. These robots operate semi- or fully autonomously to perform services useful to the well-being of humans and equipment. With the aim of keeping our robot as simple as possible, while able to perform the initial goals, i.e. an autonomous vacuum cleaner robot able to randomly navigate through a room or a house with the minimum human assistance.

In this proposed system, we have designed a Bluetooth based Wireless Floor Cleaning Robot with Dual Brush cleaning mechanism. The system uses batteries to power the vehicle movement motors as well as the floor cleaning motor. We use a Battery Charger to charge this battery. The Floor cleaning Motor and vehicle motors are interfaced to a AVR microcontroller unit that controls the working of all the motors. Motor driver is used to drive DC geared Motors. Bluetooth Module is used for Wireless Connectivity between Android Phone and Floor Cleaning Vehicle.

To control the Movement of the Robot, Bluetooth Technology is used. User has to connect this Robot using Bluetooth based Android Application. Communication between the robot and user is done using RF2.4ghZ Frequency. We can control the Robot Movement Left / Right / Forward / Backward / Cleaning Brush-Control using this Application. Using this feature, user can clean any corner of the floor using this Application

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EXPERIMENTAL EVALUATION FOR THE PERFORMANCE OF VCR DIESEL ENGINE BY USING CALOPHYLLUM INOPHYLLUM BIO DIESEL WITH NANO ADDITIVES OF ALUMINIUM OXIDE

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ABSTRACT

Day by day vehicle population in the world is increasing and usage of fossil fuel is also increasing. The countries like INDIA are depending on other countries for the petroleum-based fuel and it will affect the development of the country also. The India has lot of resources to produce Liquid alternate fuels like Ethanol, Methanol, and Bio-Diesel etc. The viscosity of the Bio diesel is high compared to diesel fuel. So, due to high viscosity the atomization of fuel is less causes poor combustion, high in emissions. To overcome these problems Nano metal oxides are utilizing as a fuel additive in fuels for increasing the combustion as well as to reduce the emissions. The metal oxides like zinc oxid0e (ZnO), Cerium Oxide (CeO_2), Aluminum Oxide (Al_2O_3) will donate the oxygen molecule in lattice structure during combustion process causes proper combustion. The present work is to check the performance, parameters of a CALOPHYLLUM INOPHYLLUM bio diesel and its blends (CIB10, CIB20, CIB30 and CIB100), results are compared with the diesel fuel. The aluminum oxide is added to the best blend at a proportion of 25 ppm,50 ppm and 75 ppm and the performance and emissions parameters are investigated.

Key words: Aluminum Oxide Nano Particles, Bio Diesel, CALOPHYLLUM INOPHYLLUM, Emission, Performance

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DESIGN AND FABRICATION OF WATER PUMPING SYSTEM USING WIND MILL

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B.Pavan kumar*

B.Arun bhaskar*

A.Jnanendra*

K.Vijay kumar*

ABSTRACT

In our project wind energy is used to rotate the wind blades. This blade coupled to the shaft. At the end of shaft the flywheel is placed. The eccentric arrangement is provided in the flywheel. When the blade rotates automatically flywheel also rotates. Due to the eccentric arrangement the rotation motion of the flywheel is converted into linear motion. This reciprocating motion is given to the handle of the pumping system. The up down motion of the handle is given to the piston, where the water is sucked using pressure variation from lower ground. Finally the water is supplied to the outlet. Wind blade provides the continuous motion which helps to supply the water continuously .Since time immemorial, the main source of energy has been coal, oil, natural gas, nuclear energy, wood and coal. However, all these sources are limited and are the main cause of pollution and this has led to development and more focus on sustainable energy supply with minimum pollution effects. Hence research and analysis has shown that wind energy, solar energy and biomass are the most prominent solutions to the above problems because they are eco -friendly and readily available in nature.

KEYWORDS:VAWT, HAWT, solidity, eccentric pump connection, reciprocating pump.

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DESIGN AND FABRICATION OF ROPE MAKING MACHINE

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Abstract: A rope making machine is used for production of different types of wires such as accelerator wires, power transmission wires, etc. depending on applications and sizes of machines. In conventional machine, number of gears and space required is more .Also it is robust in construction.

In our modified machine, we use the synchronous AC motor to transmit power to frame, which is attached to the other end of synchronous motor. An epi-cyclic gear system is attached to the frame which provides rotation to the bevel gear system due to which spindle get rotated and winds the rope over it. Due to the rotation of frame wire get twisted .Because of simultaneous operation of twisting and winding of wires, the rope get produced.

Keywords –**Winding, wire rope, spur gears, load distribution, Epi-cyclic gear train.**

I. INTRODUCTION:

Our project work, rope making machine presents the work of making a rope from the four single strands which are twisted into a single rope and that rope is rotated onto a spool which is fixed as the head of the machine. Four strands were twisted together to make a rope. The strands were attached to the same hook. Three planetary gears which are induced in an internal gear are the ones that twists the single stranded spools and thus twisting the strands into a rope. The rope stayed together because the twists went in opposite directions. This machine will run by an AC motor which have a capacity of 0.25 Hp and has a 1460 rpm of speed. By making this machine the production of the rope will be more when compared to that of making of rope by human effort, which eventually saves time and labor cost and increases the production rate of the rope making.

The epi-cyclic gear worked winding machine winds a material, for example, metal wire, string or paper, onto a center, spool or bobbin. The paper manages the pedal worked winding machine. So we are exhibiting a creative technique for manual worked winding machine. This will eventually diminish cost and time. In any case, the fundamental favorable position is that we are proposing the strategy that is totally going to take out the high cost.

There are a couple of unmistakable sorts of turning machine from essential manual urge machine to complex PC numeric control (CNC) machines. A part of the more run of the mill utilizes for winding machines are twist winding, rope winding, and determined fiber winding. A curl winding machine is one of the kinds of winding machine that accessible in ventures today.

The loop winding machine can be arranged by their speed levels and limit. The regular utilization of curl winding machine is to twist loop for a transformer pointer engines and gags. Numerous ventures utilize this gadget including material, hardware, and wire businesses. A manual winding machine ordinarily has an inside on hub and the customer energizes wire, rope or other material onto the middle.

The customer controls the pivot speed and supports the material through client hands, overseeing it to control the weight and load plan. These essential machines may be of a seat top size or tremendous stay singular winder. In this project we are going to design and fabricate a rope making machine. The main work that is done on this machine is that it will take four single threads and by twisting them, they will turned out into a rope. This machine will run by an AC motor which have a speed of 1460 rpm (0.25 Hp)

2. HARDWARE USED

AC Motor:

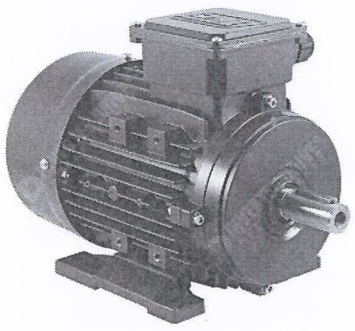

Fig-1: AC Motor

DESIGN AND FABRICATION OF MAGNETIC LEVITATING FRICTIONLESS VERTICAL WINDMILL

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ABSTRACT: Wind energy is one of the renewable energy source, power generation by using wind energy is found to be multifold due to more demand and supply gap in electrical energy system. Magnetic levitation wind turbines have several advantages over conventional wind turbines. For instance, it is able to use winds with starting speeds as low as 1.5 meters per second (m/s) because of negligible friction achieved with the help of magnetic levitation created and due to the assistance from magnetic field. Also, the it could operate in winds exceeding 40 m/s. Hence maglev wind turbine has a great future potential in terms of energy generation. In this aspect the current project work would like to address certain design issues and proposes to design, fabricate and test a prototype of magnetically levitated vertical axis wind turbine providing stated advantages, the prototype will be fabricated and tested for the outcome.

KEY WORDS: Magnetic levitation, Vertical wind turbine and generator, Wind energy, Neodymium magnets

I. INTRODUCTION:

Wind power Technology has played a significant role in power production. The wind turbine is used for converting kinetic energy of wind into electrical energy. The wind with velocity strikes the blades, then the wind spin a shaft, which connects to a generator and produces electricity. The Magnetic levitating vertical wind turbine is designed in such a way that it reduces the friction. The main advantages are that it is frictionless and it uses magnetic levitation and it does not need to vast spaces required by more conventional wind turbines. It also requires little maintenance if required. The unique operating principle behind this design is through magnetic levitation which is supposedly an extremely efficient system for wind energy. The vertically oriented blades of the wind turbine are suspended in the air replacing any need for ball bearings. The aim of this project is to design and implement a magnetically levitated vertical axis wind turbine system that has the ability to operate in both low and high (1.5m/s to 40m/s) wind speed or velocity conditions. This new model of wind turbine uses magnetic levitation to reduce the internal friction and this magnetic levitating frictionless vertical wind turbine produces more energy than a conventional turbine, at the same time decreasing operational costs by 50% over the traditional wind turbine. Hence this technology provides an extreme efficient, versatile and elegant method of producing power from wind with nearly zero pollution. The choice for this model is to showcase its efficiency in varying wind conditions as compared to the traditional horizontal axis wind turbine and contribute to its steady growing popularity for the purpose of mass utilization in the near future as a reliable source of power generation. Hence the main objective of this project is to harness wind energy in more efficient way with frictionless magnetic levitated operation.[1]

II. Principle of magnetic levitation:

Magnetic levitation (Maglev) is a method by which an object is suspended without any support with the help of the strong magnetic field. The repulsive force of magnets used for reduction of effect of gravitational force significantly. Magnetic force is used for reducing of gravitational force and to lift up the objects in air. By this technique implementation of this vertical axis wind turbine is used for having negligible friction and there by the wind turbine starts rotating at lower wind speeds[2].

Also known as magnetic levitating, this phenomenon operates on the repulsion characteristics of permanent magnets. This technology has been predominantly utilized in the rail industry in the Far East to provide very fast and reliable transportation on maglev trains and with on-going research its popularity is increasingly attaining new heights. Using a pair of permanent magnets like neodymium magnets and substantial support magnetic levitation can easily be experienced. By placing these two magnets on top of each other with like polarities facing each other, the magnetic repulsion will be strong enough to keep both magnets at a distance away from each other. The force created as a result of this repulsion can be used for suspension purposes and is strong enough to balance the weight of an object depending on the threshold of the magnets. In this project, it is used to implement this technology form the purpose of achieving vertical orientation with the axial flux generator.

FLOOR CLEANING ROBOT WITH IoT BASED CONTROLLER

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Abstract: Households of today are becoming smarter and more automated. Home automation delivers convenience and creates more time for people. Domestic robots are entering the homes and people's daily lives, but it is yet a relatively new and immature market. However, a growth is predicted and the adoption of domestic robots is evolving.

In this proposed system, we have designed a IoT based Wireless Floor Cleaning Robot with Dual Brush cleaning mechanism. The aim of this project work is to develop and modernized process for cleaning the floor; hence it is widely used in house, hospitals, shops, office, etc. This system is designed by using microcontroller, Wifi module for wireless communication and Ultrasonic sensor for obstacle detection and avoidance.

Keywords – **Microcontroller, Node MCU, Motor driver, LCD screen, Brushes.**

I. INTRODU CTION

In present days, robotic cleaners have taken major attention in robotics research due to their effectiveness in assisting humans in floor cleaning applications at homes, hotels, restaurants, offices, hospitals, workshops, warehouses and universities etc. Basically, robotic cleaners are classified on their cleaning technique like floor mopping, dry vacuum cleaning, sweeping etc. Some products are based on simple obstacle avoidance using infrared sensors while some utilize laser mapping technique. All cleaning and operating mechanism of robotic floor cleaners has its own advantages and disadvantages. For example, robots utilizing mapping are relatively faster, and energy efficient but costly, while obstacle avoidance based robots are relatively less time consuming and less energy efficient due to random cleaning. The main objective of this work is to fabricate a smart floor cleaning vehicle using IoT based control.

IoT or internet of things is an upcoming technology that makes use of internet to control/monitor electronic/mechanical devices, automobiles and other physical devices connected to the internet. IOT gives user the ability to control and monitor more than digital things easily through a comfortable GUI over the internet.

In this proposed system, we have designed a IoT based Wireless Floor Cleaning Robot with Dual Brush cleaning mechanism. The system uses 12V batteries to power the vehicle movement motors as well as the floor cleaning motor. We use a 12V Battery Charger to charge this battery. The Floor cleaning Motor and vehicle motors are interfaced to a Node MCU microcontroller unit that controls the working of all the motors. L293D Motor driver is used to drive 12V DC geared Motors. Wi-Fi based internet connectivity is provided using ESP866 Wi-Fi Module.

To control the Movement of the Robot, IoT Technology is used. User has to connect this Robot using IoT based Android Application. Communication between the robot and user is done using Wi-Fi Internet Connectivity. User can access and control the robot Movement wirelessly from anywhere in the world. He / She can control the Robot Movement Left / Right / Forward / Backward / Cleaning Brush-Control using this Application. Using this feature, user can clean any corner of the floor using this Application.

In this project Blynk app is used to control the movements of the bot. Blynk is a Platform with iOS and Android apps to control Microcontrller, Arduino , Raspberry Pi and the likes over the Internet. It's a digital dashboard where you can build a graphic interface for your project by simply dragging and dropping widgets. It's really simple to set everything up and you'll start tinkering in less than 5 mins.

Blynk is not tied to some specific board or shield. Instead, it's supporting hardware of your choice. Whether your Arduino or Raspberry Pi is linked to the Internet over Wi-Fi, Ethernet or this new ESP8266 chip, Blynk will get you online and ready for the Internet Of Your Things.

3DOF ROBOTIC ARM WITH IoT BASED CONTROL

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Abstract: - The ongoing revolution of Internet together with the growing robotics in many activities of everyday life. Internet of things has taken over all the heavy loads from human to itself. Internet of Things (IOT) is basically a connection of many devices to interconnect themselves. As Robots are used to help mankind in various environments if we combine the Robots and Internet of things we can achieve more than we can think of. This project discusses technological implications, open issues, and target applications in the IoT-aided robotics domain.

Keywords – **Microcontroller, Node MCU, Motor driver, LCD screen, RF camera.**

I. INTRODU CTION

For the people who are indulged in electronics either as a hobby or as a profession who kind off happens to have more interest in robotics this project is the key in which most of precise work which humans cannot do repeatedly, this is where a robotic arm or we can say a pick n place robot comes into picture.

Robotics is the branch of mechanical engineering, electrical engineering and computer science that deals with the design, construction, operation, and application of robots, as well as computer systems for their control, sensory feedback, and information processing. A Robotic arm is a type of mechanical arm, usually programmable, with similar functions to a human arm; the arm may be the sum total of the mechanism or may be part of a more complex robot. The links of such a manipulator are connected by joints allowing either rotational motion (such as in an articulated robot) or translational (linear) displacement.

The internet of things (IoT) is the network of physical devices, vehicles, buildings and other items embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data. The IoT allows objects to be sensed and controlled remotely across existing network infrastructure, creating opportunities for more direct integration of the physical world into computer-based systems, and resulting in improved efficiency, accuracy and economic benefit. When IoT is augmented with sensors and actuators, the technology becomes an instance of the more general class of cyberphysical systems, which also encompasses technologies such as smart grids, smart homes, intelligent transportation and smart cities. Each thing is uniquely identifiable through its embedded computing system but is able to interoperate within the existing Internet infrastructure.

ENHANCEMENT OF WELD BEAD HARDNESS BY EMPLOYING RANDOM VIBRATION DURING ARC WELDING

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Abstract. Welding is one of joining process, in which high residual stresses are developed. To decrease these stresses, methods like heat treatment and shot peening are used in earlier days. But these methods require separate equipment and also consume lot of time. To reduce cost of extra equipment and reduce time a new technique is developed in the present work. In this technique vibrating table stand is fabricated with the help of arc welding, Random vibrations are generated by the rotation of cams and shaft arrangement attached at the bottom of the vibrating table. Speed of the cam shaft is varied by controlling the Rheostat and autotransformer. Experiment is conducted on the mild steel work pieces at five different speeds of cam shaft (800 rpm, 850 rpm , 900 rpm, 1000 rpm and 1100 rpm). Hardness tests are carried out on the welded work pieces by Brinell Hardness machine. It reveals that up to 900 rpm cam shaft speed hardness value increases, beyond that speed hardness increases rapidly that leads to cracks in the weld bead.

Keywords: Residual stresses, Heat Treatment, Shot Peening, Random Vibrations, Hardness.

1.Introduction:

Welding is used to join metals with weld joint liquescent or without liquescent, with or without filler metal and with or without pressure. Welding is used almost all manufacturing and industrial areas like Power, Fertilizer, Petro-Chemical, Automatic, Food Processing etc. In most of the welding processes metals are joined by melting the edges by application of heat and filler metal is added in the melting region. Welding process is treated as totally different manufacturing process because of localized, differential heating and cooling of work pieces. The joints welded by arc welding have lower harness value because of faster cooling rate. In welding process solidification process start after formation of nucleation. Nucleus size will grow with solidification.

Welding is not a 100% defect free manufacturing process. The defects like residual stresses, blow holes and porosity are leads due to the factors like welding speed, weld angle, current, voltage, environment etc. These defects reduces the durability of welded joints.

Present work focuses on the process of reducing residual stresses in the weld bead. Different thermal cycle (that is heating to peak temperature and cooling at different temperature during welding) are the main reasons for developing residual stresses in the region closed to the fusion boundary (that is heat affected zone).

Compressive residual stresses are developed starting of welding, and these are decreases as the metal is melting and comes to zero when the metal melted completely. So the compressive residual stresses are not a problem in welding process. Tensile residual stresses are developed during cooling of weld bead, because shrinkage is not freely allowed due to metallic or constraints from work piece clamping. These tensile residual stresses are increases until the work piece attains room temperature. The mechanism behind the formation of residual stresses is localized heating and cooling which leads to differential volumetric expansion and contraction of metal around the weld zone.

Residual stresses favours the fracture under external loading. If the load is tensile, the compressive residual stresses increases strength of material shown in Fig.1, where as Fig.2 shows tensile residual stresses decreases the strength of the material under external tensile loading.

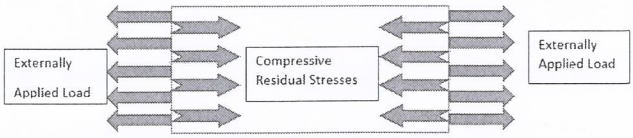

Fig.1 Compressive Residual Stresses

DESIGN AND FABRICATION OF MULTIPURPOSE MACHINE TOOL

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Abstract : The aim of our project is to design and fabricate a multipurpose device. With this device a number of operations can be performed. They are as follows: Drilling, Grinding, Turning, Shaping.

By means of this machine various operations can be performed using same power. So this multipurpose device is used for various operations with a less amount of investment.

Today we see that these operations are the heart of any workshop or machine shop and they are indispensable, so far the time saving of any organization four different jobs on the single machine. This machine perform multipurpose operation at same time which is controlled or operated by induction motor which is run with the help of current.

IndexTerms - **Turning, Depth of cut, Cutting angle, Shaping, Drilling, Grinding.**

I. INTRODUCTION

The project work subject is one, in which actually we are leaning the theoretical concepts in practical way. Also the practical experience is one of the aims of this subject. For a developing industry these operating performed and the parts or components produced should have its minimum possible production cost, then only the industry runs profitably. There are a number of units having used in industries for various purposes.

Drilling:

Drilling is a cutting process that uses a drill bit to cut or enlarge a hole of circular cross-section in solid materials. The drill bit is a rotary cutting tool, often multipoint. The bit is pressed against the work piece and rotated at rates from hundreds to thousands of revolutions per minute. This forces the cutting edge against the work piece, cutting off chips from what will become the hole being drilled.

Grinding:

Grinding Machines are also regarded as machine tools. A distinguishing feature of grinding machines is the rotating abrasive tool. Grinding machine is employed to obtain high accuracy along with very high class of surface finish on the work piece. However, advent of new generation of grinding wheels and grinding machines, characterised by their rigidity, power and speed enables one to go for high efficiency deep grinding (often called as abrasive milling) of not only hardened material but also ductile materials.

Turning:

Turning is a form of machining, a material removal process, which is used to create rotational parts by cutting away unwanted material. The turning process requires a turning machine or lathe, work piece, fixture, and cutting tool. The work piece is a piece of pre-shaped material that is secured to the fixture, which itself is attached to the turning machine, and allowed to rotate at high speeds.

The cutter is typically a single-point cutting tool that is also secured in the machine, although some operations make use of multi-point tools. The cutting tool feeds into the rotating work piece and cuts away material in the form of small chips to create the desired shape.

Shaping:

The shaping machine is used to machine flat metal surfaces especially where a large amount of metal has to be removed. Other machines such as milling machines are much more expensive and are more suited to removing smaller amounts of metal, very accurately.

The reciprocating motion of the mechanism inside the shaping machine can be seen in the diagram. As the disc rotates the top of the machine moves forwards and backwards, pushing a cutting tool. The cutting tool removes the metal from work which is carefully bolted down.

II. LITERATURE REVIEW

Sharad Srivastava [1] Developing the conceptual model of a machine that could perform different and different operations at the same time and should be economically efficient. In this machine, in reality, we are giving impulse to the main shaft, to which the mechanism of the Scotch yoke is connected directly, the mechanism of the Scotch yoke is used for the cutting operation. In the main axis, we use a conical system for power transmission in two positions. The model allows us to perform the operation in different work centers simultaneously, as it receives units from a single power source. The goal of this model is the conservation of electricity (energy supply), the reduction of costs associated with the use of energy, the increase in productivity.

Pradip R. Bodade [2] proposed a machine able to perform operations such as drilling, grinding, cutting and manufacturing of "MULTIFUNCTION MACHINES". The industries are basically destined for the production of goods and services

SOLAR POWERED MULTIPURPOSE MILITARY ROBOT

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***Abstract*:** This Project is designed for Multipurpose Wireless Surveillance Robot for WAR Fields and Rescue Operations. An Unmanned Ground Vehicle (**UGV**) Robot is a vehicle that operates while in contact with the ground and without an onboard human presence. This can be used for many applications where it may be inconvenient, dangerous, or impossible to have a human operator present. Unmanned robotics is being actively developed for both civilian and military use to perform a variety of dull, dirty, and dangerous activities. There are a wide variety of remote-operated UGVs in use today. Predominantly these vehicles are used to replace humans in hazardous situations. Examples are explosives and bomb disabling vehicles.

This Surveillance Robot is controlled through Android Application using Bluetooth Interface within desired range. This Robot is powered using a 12V Solar Panel and a 12V Battery to provide continuous power to Robot. It is Equipped with Metal Detector, which detect any presence of land mine and give a High Audio Alert to the Monitoring Authorities. A RF Camera is used in the Front end of this Robot, to get clear view of nearby image and War field status.

Keywords: Metal detector, RF camera, Bluetooth, Solar panel, Battery.

1. INTRODUCTION

An unmanned ground vehicle (UGV) is a vehicle that operates while in contact with the ground and without an onboard human presence. UGVs can be used for many applications where it may be inconvenient, dangerous, or impossible to have a human operator present. Generally, the vehicle will have a set of sensors to observe the environment, and will either autonomously make decisions about its behavior or pass the information to a human operator at a different location who will control the vehicle through tele operation.

This Project is designed for Wireless Surveillance in WAR Fields and Rescue Operations. An Unmanned Ground Vehicle (UGV) is a vehicle that operates while in contact with the ground and without an onboard human presence. UGVs can be used for many applications where it may be inconvenient, dangerous, or impossible to have a human operator present. Unmanned robotics is being actively developed for both civilian and military use to perform a variety of dull, dirty, and dangerous activities.

2. LITERATURE REVIEW

Tarunpreet kaur et al [1], studied a designed small scale multipurpose military robot manual controllable mode, user controls this security robot from the cell phone which generates dual tone frequency which is detected by DTMF decoder and controls it manually. User will change the path of robot according to the real time visual information of surrounding provided by the camera equipped on robot. Finally, he concludes that the development of security robot which also encourages the use of inexhaustible resources as a power source. This robot also has capability to detect bombs at border and highly defense areas. This security also extends the communication range by using cell phone as a receiver for user.

M. Mobarak Hossain, et al [2], Both are studied on military robot and also given some features on their designed robot, these are mainly used for the both in civil and military fields. The design and placement of various sensors, wheel system, mechanical arms as well as wireless communication mechanism and remote controlling mechanism are discussed here in details. finally, they conclude that these kinds of robots are used in mainly in civil and military fields. For civil use, it can detect gas leak in home or industry, surveillance of shopping mall, parking lot, office, industry, bank, museums, helping rescue operation during natural disaster and aftermath like searching for human, supplying food and other essentials to the people under unreachable ruin.

Dr. S. Bhargavi et al [3], has researched an intelligent combat robot designed specifically for war field. Protection has been provided from enemies. Whenever enemies appear in front of the robot it will fire the laser gun. This remote operation is provided by user sitting at one place. A wireless camera is mounted on the robot. A real time video is transferred to the user pc and whenever enemies are present in front of the robot then user can shoot enemy by laser gun which is operated remote.

DESIGN AND DYNAMIC ANALYSIS ON NON PNEUMATIC TIRES WITH DIFFERENT STRUCTURE

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Abstract: A Conventional tire is made up of air enclosed rubber packed by means of compressed air. Conventional tires over a period have been dominating the world marketplace because it exhibits ride excellence and robustness. But having certain disadvantages like bursting out on driving and regular pressure maintaince. Hence Non-Pneumatic tyres (NPT) were introduced. NPT is a submissive of cellular flexible spoke component which acts as a air of a traditional tire, as the name indicates that it is a type of tire that doesn't use air to support the load .The properties of NPT like contact pressure, rolling resistance and load carrying capacity can be varied by altering the dimensions or material used to manufacture NPT.The main objective of the project is design different structures of wheel spokes in CATIA workbench and analyze by applying the boundary conditions and getting results over stress, strain and total deformation

Index Terms **– Non Pneumatic tyres, CATIA, ANSYS.**

I. INTRODUCTION

A tyre is most important part of any vehicle. Tyre is a rubber member which provides cushioning effect as well as provides clearance to vehicle. . Tyre which is used in automobile, bicycle, motorcycle is pneumatically inflated structures which provide a good rolling, cushioning effect. Such tyre is using numbers of year and they are developing. Some companies are trying to develop tyre which are airless that means they are non-pneumatic. Michelin and Bridgestone is the tyre which are firstly design, they are non-pneumatic. . Michelin and Bridgestone is the tyre which are firstly design, they are non-pneumatic.

In recent years, with the increasing of vehicle velocity and the expansion of the running environment, the criterions for the tyre are very high. While the ordinary pneumatic tyre has the following several problems:

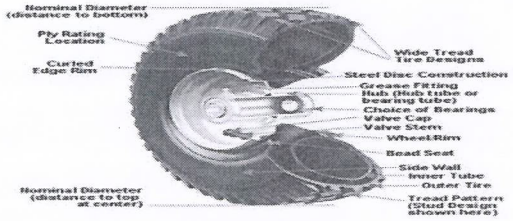
1. 1.It is easy to tie the thorn and burst and the burst may cause fatal accidents.
2. The air pressure inside should be maintained regularly.
3. The manufacturing process is complex.

In military application, the ordinary tyre cannot bear attack from light weapons and landmines, so that will affect the tasks. In pneumatic tire due to the characteristics of pneumatic and rubber the protection ability of ordinary tyre is difficult to be improved, Therefore new structure of tyres are explored and non pneumatic tire appears. The Tweel (a portmanteau of tyre and wheel) is an airless tyre design concept developed by the French tyre company Michelin. Its significant advantage over pneumatic tyres is that the Tweel does not use a bladder full of compressed air, and therefore it cannot burst, leak pressure, or become flat. Instead, the Tweel assembly's inner hub connects to flexible polyurethane spokes which are used to support an outer rim and these engineered compliant components assume the shock-absorbing role provided by the compressed air in a traditional tyre.

TYPES OF TIRES:

I. Pneumatic tyre:

Pneumatic or air filled tyre is tyre which is made up of hard rubber and work on compressed air. A tread, usually reinforced with steel belting or other materials, covers this inner core and provides the contact area with the road. The pressure of the air inside the tyre is more than atmospheric air pressure, so the tyre remains inflated even with the weight of a vehicle resting on it. The tyre air pressure provides resistance against forces that try to deform the tyre, but it gives to a certain degree of cushioning effect as the tyre hits bumps in the road.



Pneumatic tyre

Advantages of non pneumatic tyres:

1. Simple in assembly
2. Low rolling resistance
3. Better cooling
4. Longer tread life

DESIGN AND FABRICATION OF PNEUMATIC SHEET METAL CUTTING MACHINE

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Abstract: The objective of the project is to prepare a machine which cuts sheet metal without human efforts but operates pneumatically. Compressed air is used as working media. The compressed air moves the blades of the machine to cut the sheet of the metal. we are using scissors for simple sheet metal cutting. It is a manual method so that sheet metal are to be wasted some time because of mistakes happened such as wrong dimension etc.., and also even a simple cutting may take long time Hydraulic machines are also available for sheet metal cutting. But the method is used for only heavy metal cutting and its cost is very high. We are using a pneumatic system for sheet metal cutting in a easy way. It is operated by a pneumatic hand lever of two way control valve. Control valve is operated by a compressor. In general manual sheet metal sheering machine metal is placed in between the two sheering blades of machine and the lever is pulled down to move the upper movable blade and cut the work-piece but in that machine large force is required which can make tire to a worker who continuously works on it for mass production in large scale industry; so to reduce the human efforts pneumatic machine should choose. Hence for some development of machine, we have chosen this subject for our project. We that a good idea we develop and we can use it in many industries in surroundings and our practical knowledge, team-working skill, leadership skill will be improved.

Key Terms- **Sheet Metal, Magnetic Permeability, Pneumatic Double Acting Cylinder, Control Valve, Cutting machine.**

I. INTRODUCTION

The project is to perform sheet metal cutting operation effectively with less human effort by incorporating a machine with pneumatic power. The compressed air through Solenoid valve makes the pneumatic cylinder connected to cutting tool to perform cutting operation of sheet metal. Cutting processes are those in which a piece of sheet metal is separated by applying a great enough force to cause the material to fail. The most common cutting processes are performed by applying a shearing force, and are therefore sometimes referred to as shearing processes. When a great enough shearing force is applied, the shear stress in the material will exceed the ultimate shear strength and the material will fail and separate at the cut location. This shearing force is applied by two tools, one above and one below the sheet. Whether these tools are a punch and die or upper and lower blades, the tool above the sheet delivers a quick downward blow to the sheet metal that rests over the lower tool. A small clearance is present between the edges of the upper and lower tools, which facilitates the fracture of the material. The size of this clearance is typically 2-10% of the material thickness and depends upon several factors, such as the specific shearing process, material and sheet thickness. The sheet cutting machine is the heart of sheet metal industries. In some industries, hand sheet cutter is used which is operated manually. In these machines, we are using pneumatic cylinder for sheet metal cutting. These machines should be easy to operate and maintain also. Hence, we are introducing a pneumatic sheet metal cutting machine which will reduce manufacturing cost and minimize industrial labor problems which is the biggest headache for human. The main objective of our project is to perform job holding operation effectively with less human efforts by using a machine with the pneumatic power. This will also reduce the time required for metal cutting. By using this machine we can increase the production rate and automatically the industry will be in profit. Automation plays an important role in mass production. Automation can be achieved through pneumatic form.

The main advantage of pneumatic system is economically cheap and easy to handle.

The manufacturing operation is being atomies for the following reasons.

1. To reduce human efforts.
2. To increase production rate.
3. To increase efficiency of industry.
4. To reduce the work load.
5. To reduce production time.

Advantageous of pneumatic

1. Wide availability of air.
2. Compressibility of air.
3. Easy transportability of compressed air in pressure vessels, containers and in long pipes.
4. Fire proof characteristic of the medium.
5. Simple construction of pneumatic elements and easy handling.
6. High degree of controllability of pressure, speed, and force.
7. Possibility of easy but reasonably reliable remote controlling.
8. Easier maintenance.
9. Explosion-proof characteristic of the medium.
10. Comparatively cheaper in cost than other systems.

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Design, Analysis and Fabrication of Safe Holder and Cam Dies in Injection Molding

B Joga Rao, Ch Rupendra, D Vivek, D Yuva Sai, B Sudhakar Raju

Abstract: Injection molding is one of the very significant methodologies in the plastic manufacturing industry. Production of any shape in the injection molding, mold with cavity must require. For this mold making three phases were involved in this project starting from design, analysis, manufacturing respectively. The objective of this project is to introduce detailed steps on design mold and using the simulation software to analyze the material flow, temperature and pressure characteristics of the product. The product designed and analyzed for this project is SAFE HOLDER and CAM. The manufacturing of mold is done by using advanced machinery such as CNC.

The design and analysis of this product and mold were made by the designing analysis software CATIA V5, ANSYS 15.0, which is then stimulated by the use of Fluid Flow (Fluent) tool.

This project was very useful in knowing the fluid characteristic behavior subjected to flowing inside the mold and also observed the variation of values with respect to given values at each stage.

In this project, the analysis performed with taking polypropylene as a fluid from propylene polymer and steel as solid material for the die with inlet values are 230℃ temperature and 15m/s velocity.

Keywords: analysis, characteristics, die, design, Mold

I. INTRODUCTION

Mold design is the first step for developing any variety of shape required in the time of manufacturing with a specific dimension to avoid defects occurring after the actual part is removed from the die cavity in injection molding [1].

Plastic materials exhibit very convoluted properties, the challenges are facing in the making of parts and obtain characteristics required involves difficulty.

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The intricacy of injection molding allows producing a wide range of complex parts makes easier for creating different components. Injection pressure, velocity, temperature are few controlling parameters in the manufacturing of a part [2].

Problems encountered must be rectified in the design phase itself. The successful development of any part depends upon cost and profitability before the design is started. Little cost overheads per part can be compounded to very high during the lifetime of the product. Major cost involved aspects are tools, material, finishing, and grinding [3].

The die having parts are upper half, lower half, ejecting mechanism, gating systems, and vents. The plastic material used is polypropylene commonly for creating a safe holder and cam. For fast filling of the cavity, the gate is cut in such a way that it fills the entire mold in very little time. It eliminates the large time heating of plastic material. The safe holder mostly used safely guarding the small thickness cards [4].

Firstly the plastic granules are heated in heater which converts up to liquid molten state then it is fed into the die cavity through gate provided from the hopper then complete filling of the mold cavity taken place after it is allowed for cooling some time at the end final product in the shape of the cavity created in the mold by separating the die from ejection mechanism [5].

The analysis of die includes giving the initial values temperature, velocity, pressure after this solution initialization is performed for representing the variations along the walls of the mold in results for better understanding behavior of plastic flows into the mold [6].

II. LITERATURE REVIEW

[1] Mr. Kiran C. Mahale et al. According to his paper, Mold Design forms the basis of the development work required for producing the desired number of units in a given time frame. The simplicity of the mold is the key to ensure the quality of the component produced and the associated costs of development. Small cost overheads per part can be compounded to large cost differences over the life span of the part. [11] Mohit Milind Sardare et al. According to his paper, the plastic injection molding process is a cyclic process with four primary steps. These are filling, packing, cooling and ejection. The filling step begins with resin feeding and appropriate additives from the hopper to the heating/injection system of the molding machine. This is the stage the mold cavity is filled with hot melted polymer at injection temperature. After the cavity is filled, in the "packing stage", the additional polymer melt is packed into the cavity at a higher pressure to compensate the expected shrinkage as the polymer solidifies.

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Experimental Examination on Forced Convection Heat Transfer in laterally Perforated finned Metal Matrix Composite Heat Sink

E. Nirmala devi, T.Rajesh

Abstract---*Day by day a huge measure of research is proceeding to discover the cooling solutions for electronics including various applications for CPU, LED coolers, relay cooling frameworks. The serious issue including electronic parts cooling is the structure of heat sinks and their compatibility with the electronics for the predefined applications. Likewise, the quick-paced progressions in computing driving for the production of superior processors with incorporated complex circuits for which the cooling turned into a troublesome task which became challenging the existing market. This study targets building up a metal matrix composite (MMC) heat sink for low coefficient of thermal expansion (CTE) in electronic parts. Aluminum nitrate (AlN) takes like 12.5% (wt/wt) and mixed Aluminum (Al) to form metal matrix composite (MMC) prototype heat sinks. Prototype metal matrix composite (MMC) properties were evaluated experimentally. The modeling of the laterally perforated finned heat sink (LA-PFHS) is done Solid-works. The sinks are fabricated by using CNC machining. Two configurations of circular piercings on the fins are used in which the diameter and the spacing between piercings vary. In a rectangular insulated duct, the experimental analysis on the three metal matrix composite (MMC) heat sinks was performed under the phenomenon of forced convection at varying heat fluxes and at ambient conditions of temperature 30°C, pressure 101.326 KPa and 45% humidity. From 1.0 m/s to 4.0 m/s wind velocities and with an interval of 1 m/s the experimentation were carried out. Results show that the model III prototype metal matrix composite (MMC) heat sink proposed in this study shows a decrease in thermal resistance (R_{th}) by 50.51 %.*

Keywords: forced Convection heat transfer, coefficient of thermal expansion, Metal Matrix Composites, heat sink, Reynolds number (R_e), Thermal resistance (R_{th}), Pressure drop, Pumping power.

I. INTRODUCTION

Thermal management has become very important challenging in today's electronics world. Overheating of electronic devices is a major issue in computing systems, avionics, battery management, and in different industrial and non-industrial applications. Electronic device life span can be increased by effective thermal management of the devices. Heat sink dissipates the heat from the electronic devices.

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Air-cooled heat sinks have been commonly used as an answer for overseeing heat-related issues of electronics because of their adequacy, financial plausibility, unwavering quality, and straight forwardness in support. Air-cooled heat sinks are susceptible to relatively low heat transfer coefficients and have large base temperature variations.

Increasing air flow can overcome this problem but in real applications this method is limited as it increases the pumping capacity there by increasing the heat sink occupancy space. The surface boundary layer thickness dictates the heat transfer rates. Disruption of the laminar boundary layer to turbulent boundary layer increases the heat transfer from the surface. Boundary layer interruption uses the same phenomenon to enhance the heat transfer from the surface. Perforation of the fins is one among different boundary layer interruption techniques and lead to lighter systems that add weight advantage in the applications. Perforations can be made on the lateral surface or along the length. Shaeri et al. [1] investigated the pressure drop and heat transfer characteristics under different flow regimes. Square cross-sectional perforations along the lateral surface are used to perform an experimental investigation on the heat sink with flows varying from laminar to turbulent. Perforation size and porosity are taken to study thermo fluid characteristics of the heat sink. Compared to the solid fin heat sink, the mass-based thermal resistance (R_{th}) is lower by 41-51% for perforated heat sink under constant pumping power. Chingulpitak et al. [2] were proposed the thermal performance of plate-fin heat sink with lateral perforations. Circular cross-section perforations are made along the lateral surface. The effect of diameters and a different number of circular perforations on the fins of heat sinks are studied. The results showed that the 3 mm diameter and 75 perforations exhibited the 11.6 % more heat transfer rate than the solid fin heat sink. Kim et al. [3] had been numerically evaluated the performance of a rectangular perforations heat sink and branched fin heat sink. A new numerical volume averaging model is developed to study the performance of branched fin heat sink results showed that the branched fin heat sink and better thermal performance compared to the optimized rectangular fin heat sink. **Ahmed et al. [4]** numerically evaluated the effect of ribs inserted in the plate-fin heat sink. Position, height, and number are taken as the study parameters. Results showed 1.55 times increase in Nusselt number compared to the solid fin heat sink. **Cola et al. [5]** investigated the effect of carbon nano tubes as the interface materials for getting better thermal performance.

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Aqua Power Generating Silencer

E.Nirmala Devi, V. Dinesh Bhargav

Abstract: Management of Air contamination is most significant issue from the general public health of view, because each distinctive individual breaths around 22000 times each day. Air contamination causes around 7,000,000 deaths per year around the world. Development and convergence of the population in urban communities, just as the manner by which we consume various sources of energy in urban zones through transport or air conditioning and heating systems, among others, causes the emission of harmful gases at huge quantity that are dangerous to people health. Automobile vehicles are a significant pollution contributor, delivering critical measures of carbon monoxide, nitrogen oxides, and other contamination. In 2013, transportation contributed the greater part of the carbon monoxide (CO) and nitrogen oxides (NOx), and one-fourth of the hydrocarbons (HC) emitted into atmosphere. These vehicles don't seem to be the only sources of pollution, different sources like power generating stations, Exhaust from industries and factories, refuse burning etc. and also contribute intensely to defilement of our environment. So it is crucial that serious endeavors should be made to protect our environment from degradation. In the present study an Aqua Power Generating Silencer is an attempt, in this direction; it is mainly dealing with control of emission, noise & recovery of waste heat from exhaust gases to generate electricity.

Keywords: Aqua Power Generating Silencer, Air Contamination, emissions, Recovery of waste heat.

I. INTRODUCTION

An Aqua Power Generating Silencer is fitted to the exhaust pipe of engine. Sound produced under water is less hearable than it produced in atmosphere. This mainly because of small sprockets in water molecules, which lowers its amplitude, thus, lowers the sound level [1], [3], [6], [9]. Because of this property water is used in this silencer, and Heat absorbed will utilized and hence its name AQUA POWER GENERATING SILENCER. The noise and smoke level is considerable less than the conventional silencer, it is cheaper, no need of catalytic converter and easy to install. It is imperative that serious attempts should be made to conserve earth's environment from degradation. It is needed to utilize the available heat energy stored in exhaust gases of an I.C engine, thermo-electric module is used for this purpose [10], [12], [14], [16]. An aqua power generating silencer is an attempt in this direction; it is mainly dealing with control of emission and noise and recovery of waste heat.

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II. LITERATURE REVIEW

Rahul.S.Padval et.al [1] had observed that heating is increasing on our earth because of major increase within the pollution. The fundamental part because of which the air contamination is expanding are (CO), (NOx) and lead which is get uncovered from vehicles. Also that the sources like huge factories, massive power generation plants, large scale industries etc. therefore it's needed to unravel these issues by taking numerous serious tries. Aqua silencer is one among the try taken to lessen the air contamination. It's fitted to the fumes funnel of engine or framework. This Silencer is employed to diminish the noise and for management of the emission of dangerous gases.

Akhil Anil Kumar et.al [2] had analyzed that heaps of effort is being made to scale back the pollution from gasoline and diesel engines and laws for emission limits also are obligatory. Moreover, developments in gasoline and diesel engines, combined with enhancements within the vehicles, can create fuel consumption reduction at great level within the future cars. One such advancement is improvement of the silencer unit of a motor.

P.Balashanmugam et.al [3] were proposed a scrubber tank which contains water to play an important role in absorbing the harmful products of combustion like the CO, CO_2, UBHC, oxides of Nitrogen and etc. Water can be replaced by a solution of lime to allow for the chemical reaction to happen at a quicker pace. Some of the reactions takes place between lime solution and toxic gases are,

$Ca(OH)_2 + SO_2 = CaSO_3 + H_2O$

$Ca(OH)_2 + CO_2 = CaCO_3 + H_2O$

Recognizable reduction in characteristics smell of the diesel smoke is observed. Smoke of the diesel comprises particles of ash blended in with burned or incompletely burned oil. Unburned hydrocarbons (UBHC) are not exceptionally toxic however they incorporate smell and irritants, for example, aldehydes. A dissolve of unburned hydrocarbons and different particulates with solutions of alkaline, to a substantial extent, the smell of the diesel smoke is decreased when water scrubbers are utilized.

G Maruthi Prasad Yadav et.al [4] had done analysis on the 4-stroke multi cylinder diesel engine which is connected with an aqua silencer. They concluded that amount load will increase the contaminations slowly when using the ordinary type of silencer however by using the aqua silencer, the contaminations diminishes. They discovered correlation of various silencers for sound attribute of an engine. In ordinary type of silencer the value of sound level is 83 decibels yet in an aqua silencer is 75 decibels without any load. Nearly at 50% of load in conventional silencer it produces a sound of 84.5 decibels and in an aqua silencer the sound produced is 76.5 decibels at same load.

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Fabrication and Testing of Novel Aluminium Composite Panel and Analysis of Composite Panel for Impact Loads in Collision Environment for Four-Wheelers Automobile

Valluru Nagendra babu, G Ramakrishna

Abstract: Impact loads from the crash of automobile always challenge the structural parts of the collided vehicles. Modern high – speed vehicles are subjected to high impact loads during accidents when the vehicle is accelerating at high speeds. This results in structural damage to the vehicle as well as passengers in the vehicle. In recent years, high-strength aluminum alloys have increasingly been used for building high-speed vehicles, and other types of weight-critical structures. In such structures, stiffened panels are the basic strength members. Composite panels can be used for the car body to reduce the weight of the vehicle and to increase the collision resistance. In this study, the aluminum composite panels with composite filled stiffeners are fabricated and tested experimentally under compression and impact loadings. Recycled ceramic powder, recycled steel flakes, and E - glass fiber mesh is taken as reinforcements and thermoplastic resins as matrix materials in the preparation stiffener filler composite. The composite panel specimens are fabricated and are tested experimentally under axial compression for collapse resistance.

Keywords: Composite panel, collision test, compression, stiffened cores

I. INTRODUCTION

In modern days stiffened panels are used widely as one of the engineering structures. These play a major role in civil engineering basic components, and aerospace structures and marine structures. The simplicity in the design and manufacturing of those structures, their economic feasibility and their effectiveness in resisting compression loads and lateral loads make them utilize in various engineering applications. The behavior of these panels under various types of loading is dependent on the process followed in their manufacturing and the respective applications. When the plate and stiffeners (beams with appropriate sections) are assembled by means of welding process plate stiffeners are formed [1].

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In recent years the usage of composite panels for structural applications became a major interest due to the good strength to weight characteristics. While designing the structure and during the assessment of safety for the structure, collapse strength calculation is the critical part [2]. Axial compression is the major type of loading faced by these stiffened panels. As a result, the failure of these stiffened panels will be due to collapse modes. These failure modes are mainly classified into six and are:

1. Mode I: Overall buckling followed by overall collapse
2. Mode II: Skins collapse between stiffeners without stiffeners failure, which occurs due to biaxial compression force.
3. Mode III: Collapse of skin-induced or stiffener induced failure of stiffeners together with attached skins.
4. Mode IV: Stiffener buckling
5. Mode V: Flexural - torsional buckling or stiffeners tripping.
6. Mode VI: Massive yielding.

At the least values of the ultimate loads evaluated at six modes for these stiffeners collapse.

For predicting the stiffened panels' ultimate strength, many theoretical models and numerical models have been established [3]. The research in the field of stiffened panels especially in the case of aluminum stiffened panels is limited only to the marine and aviation vehicles only [4]. In the field of automobiles, the usage of these panels is at an immature level only. This study aims at developing aluminum stiffened panels reinforced with recycled ceramic particle composites, E-glass fiber mesh composites and recycled steel flake composites in the stiffener sections. Experimental evaluations are carryout to find the collapse modes of the proposed models. The experimental results obtained are validated with the formulations by Collette [6] and Kee et al. [7]

II. MODELING AND FABRICATION OF TEST SPECIMENS

The aluminum stiffened panel structures used for marine and aviation applications is shown in Figure 1. It comprises of sheet metallic plates and support members. The nomenclature used for the composite stiffened panel structure is shown in Figure 2.

AUTOMATIC WASTE COLLECTING SYSTEM BASED ON IOT

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ABSTRACT:-

Quick increment in volume and sorts of strong and perilous waste because of ceaseless financial development, urbanization and industrialization, is turning into a blossoming issue for national and nearby governments to guarantee compelling and reasonable administration of waste. It is evaluated that in 2006 the aggregate sum of metropolitan strong waste produced universally arrived at 2.02 billion tones, speaking to an 8% yearly increment since 2003. The isolation, dealing with, transport, and removal of waste should be appropriately figured out how to limit the hazard to the wellbeing and security of patients, people in general, and the earth. The monetary estimation of waste is best acknowledged when it is isolated. As of now, there is no such arrangement of isolation of dry, wet and metallic squanders at the family level. This frame work dependent on Internet of things (IOT) and used to divide the waste in three categories like wet, dry and metallic.

INDEX TERMS:-Arduino Uno, Metal detector, IR sensor, NODE MCU, Inter of Things and blink server

INTRODUCTION:-

Waste sorting is the process by which waste is separated into different elements. Waste sorting can occur manually at the household and collected through curbside collection schemes, or automatically separated in materials recovery facilities or mechanical biological treatment systems. Hand sorting was the first method used in the history of waste sorting.

Waste can also be sorted in a civic amenity site.

Waste segregation means dividing waste into dry and wet. Dry waste includes wood and related products, metals and glass. Wet waste, typically refers to organic waste usually generated by eating establishments and is heavy in weight due to dampness. Waste can also be segregated on basis of biodegradable or non-biodegradablewaste.

Landfills are an increasingly pressing problem. Less and less land is availableto deposit refuse, but the volume of waste is growing all time. As a result, segregating waste is not just of environmental importance, but of economic concern, too.

METHOD:-

Waste is collected at its source in each area and separated. The way that waste is sorted must reflect local disposal systems. The following categories are common

- Paper
- Cardboard (including packaging for return to suppliers)
- Glass (clear, tinted — no light bulbs or window panes, which belong with residual waste)
- Plastics
- Textiles
- Wood, leather, rubber,
- Scrap metal
- Compost

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IMPROVING OF HARDNESS AND IMPACT STRENGTHS BY BANANA AND SISAL FIBRE REINFORCED EPOXY COMPOSITES FILLED WITH GROUNDNUT SHELL ASH

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ABSTRACT

In the fast-developing world, the concern for the environmental pollution and the prevention of non-renewable and non-biodegradable resources has attracted researchers seeking to develop new eco-friendly materials and products based on sustainability principles. The fibers from the natural sources provide indisputable advantages over synthetic reinforcement materials such as low cost, low density, non-toxicity, comparable strength, and minimum waste disposal problems.

In the present work, banana fibre reinforced epoxy composites filled with groundnut shell ash was prepared and the mechanical properties of these composites are evaluated. The composite samples with different groundnut shell ash and epoxy weight fractions were prepared by using the hand lay-up process and apply pressure at room temperature. Later, the samples were tested for the evaluation of mechanical properties such as impact and hardness strengths.

Keywords: Banana and Sisal fibres, Resin, Groundnut Shell Ash.

1. INTRODUCTION

It is a truism that technological development depends on advances in the field of materials. One does not have to be an expert to realize the most advanced turbine or air-craft design is of no use if adequate materials to bear the service loads and conditions are not available. Whatever the field may be the final limitation on advancement depends on materials. Nature is full of examples where the idea of composite materials is used. Wood is a fibrous composite: cellulose fibres in a lignin matrix. The cellulose fibers have high tensile strength but are very flexible (i.e. low stiffness), while the lignin matrix joins the fibres and furnishes the stiffness. Bone is yet another example of a natural composite that supports the weight of various members of the body. It consists of short and soft collagen fibres embedded in a mineral matrix called apatite. In addition to these naturally occurring composites, there are many other engineering materials that are composites in a very general way and that have been in use for very long time.

2 FABRICATION METHODS OF PMCS

There are two general divisions of composites manufacturing processes: open moulding and closed moulding. With open moulding, the gel coat and laminate are exposed to the atmosphere during the fabrication process. In closed moulding, the composite is processed in a two-part mould set, or within a vacuum bag. There are a variety of processing methods within the open and closed moulding categories.

2.1 Open Moulding Method

(a) Hand Lay-Up.
(b) Spray-Up.
(c) Filament Winding

.

(a) Hand Lay-Up

Hand lay-up is a molding process where fiber reinforcements are placed by hand then wet with resin. The manual nature of this process allows for almost any reinforcing material to be considered, chopped strand or mat. Similarly, the resin and catalyst blend can be manipulated to allow for ideal processing conditions .theprocess of hand layup is mold treated with mold release agent thin gel coat(resin) is applied, to the outside surface of molding when gel coated has

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Design and Fabrication of PVC Pipe Feeding and Cutting Machine

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Abstract -*The motto of PVC pipe feeding and cutting machine Is to slit the pipe pneumatically for the desired length and also cut the pipe in less time with least wastage generated around the pipe to make it cost-effective and ease of use the machine ,we designed and fabrication is used for cutting any pattern of an object like circular. This project works under the applications of pneumatic based systems .According to the type of material to be cut, the cutting tool can be changed, This Machine can be widely applied in almost all type of industries in which the pipe cutting process is a main operation in all industries. Normally the cutting Machine is manually hand operated one for medium and small-scale industries. In our project small and large size pipe cutting can be done. The design of PVC pipe feeding and cutting machine is done by using CATIA V5 software.*

Key Words: pneumatic systems, efficiency, guide ways, cost effective, CATIAV5 software

1. INTRODUCTION

In present day scenario, products have to be manufactured within less production time with having high accuracy dimensions that too on a bulky matter . So as to meet that requirement upgrade of machinery, methods for production are necessary. The main operation that held in the pipe industry is of three major operations i.e. feeding, clamping & cutting. These operations are either limited with time gap between their respective operations by means of either mechanisms or programmed type. When coming to mechanical type, usage of cams – followers, Geneva mechanism and other mechanisms. When comes to program type there will be usage of timers, sensors, plc circuits, counters. Here in this paper material made up of poly vinyl chloride commonly call as PVC is used for experimentation. The material for cutting operation is selected based on the stress calculated considering the pipe or rod material. But various cutters materials specifications used for mild steel rods and pipes. Torque produced by the cutter used in the machine system has been considered for cutting PVC object by help of the design data available. With the help of this system the time required to slice the objects like the pipe or rod will be less the accuracy of slicing or cutting of the material will also be improved. The system can be handled by semi-skilled operators with ease.

2. LITERATURE REVIEW

Pandit Mandar Bipinchandra et al. [1] have proposed that automatic pipe cutting machine has been used for mass production and aims decreasing the mortal involvement in order to improve the productivity and accuracy of the product. Automatic pneumatic pipe cutting machine uses a pneumatic circuit for cutting of PVC pipes which, finally decrease the cumulative time required for the complete cutting operation and increases the production rate.

P.Balashanmugam and G.Balasubramanian [2] proposed a technique in which growth of the cutter is carried out in the upward and downward direction using pneumatic double acting piston and cylinder unit arrangement, along with the foot operated direction control valve (DCV). In this type of machine high pressure air is used as working fluid for the transfer of power and the motion. The invention compressed air from the compressor is used as the force medium for this operation. There are pneumatic double acting cylinders, direction control valve and flow control valve. The arm from the compressor enters to the flow control valve. The controlled air from the flow control valve enters to the DCV. The function of DCV is to enter the air into the pneumatic cylinder. The present work involves the use of 5/2 DCV. In the first position air enters into the cylinder and pushes the piston, so that the cutting stroke is obtained. In the next position air enters into the other side of cylinder and pushes the piston return back, so that the releasing stroke is obtained.

Shital K. Sharma et.al [3] have provided an alternative to the existing automatic PVC pipe cutting machine, in terms of automating the pipe entry into the cutting apparatus, This method eliminates power fluctuation and lesser initial investment. There are many industrial applications where round bar or square bars are required to be operated on different machines to make machine components such as shafts, bolts, screws, etc. The clamping arrangement can be varied according to need of operations suitable. The overall system is compact in size, light weight, modular and flexible to be used in small work jobs which need batch production. The system even has the potential to add up a PLC system to control its overall working with ease and with

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Android Based Pick and Place Robot Vehicle for Industries

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Abstract - *Robotics researchers regularly endow robot platforms with new capabilities that increase the breadth of potential applications and push the boundaries of autonomy. In contrast, industrial automation is driven by a pragmatism dictated by the need to optimize throughput and reliability. The hope of both is that, as multi-purpose robotic platforms become more capable, they will be able to take over an increasing fraction of the tasks currently handled by application-specific, fixed installation automation, thereby granting all applications a greater level. This project is designed to develop an Industrial Robotic Arm. Typical applications of Industrial ARM include welding, painting, assembly, pick and place (such as packaging, palletizing and SMT), product inspection, and testing; all accomplished with high endurance, speed, and precision.*

This Industrial Robotic ARM has 3 Degree of Freedom and the end of ARM has a Gripper Mechanism, which is used to Pick and Place any Object. Geared Motors are used in this ARM Mechanism of 3.5 RPM and 10 RPM. L293D Motor Driver is used to control the Motor of the ARM. This Robotic ARM can move in forward, backward, left and right Direction. It has a user-friendly interface on its control using an Android Application. This Android Application can be installed in any Mobile Phone to get control over this Industrial Arm.

1. INTRODUCTION

A pick and place robot vehicle are used to pick up an object and place it in the desired location. It can be a cylindrical robot that provides the movement in horizontal, vertical and rotational axes or a spherical robot providing two rotational and one linear movement.

The basic operation of a pick and place robot vehicle is performed by its joints. Joints are homologous to human joints and are used to join the two consecutive rigid bodies in the robot. There can be either a rotary joint or a linear joint. To add a joint to any link of a robot, we need to know about the degrees of freedom and the degrees of movement for the corresponding body part. The Degrees of freedom implements the linear and rotational movement of the body whereas the Degrees of movement imply the number of axes that the body can move. A simple pick and place robot consists of two rigid bodies on a moving base, connected with a rotary joint. A rotary joint is the one that provides rotation in 360 degrees around any one of the axes.

In this project, we have designed a 3 Degree Freedom Industrial ARM. These types of Industrial ARM are mostly used in Automobile Industries, Automatic Welding, Packaging Industries, and Painting Industries. Movement of this ARM includes Sideways (Left / Right, Up / Down), and Gripper Control (Open / Close). ATmega16 Microcontroller is used as a Brain of this Industrial ARM. An Android Application is used to control the ARM for various movements. We can control this ARM using Mobile Phones / Tablets that has Android Operating System. We also use Bluetooth technology to communicate with Mobile phones and the ARM. This Android Application is developed using MIT App inventor online web platform. The android application device transmitter acts as a remote control that has the advantage of adequate range, while the receiver acts as an end Bluetooth device is fed to the microcontroller to drive DC motors via motor driver IC for necessary work.

The user first connects the Android Application with the ARM. After the successful connection a message called "Bluetooth Connected" will be displayed in the LCD module of the ARM. Once the Bluetooth is connected, the indicator light on the Bluetooth module will turn off. Now users can access the ARM using the controls (UP/ DOWN /LEFT /RIGHT/OPEN/CLOSE). Robotic Vehicles can move-in forward, backward, Left and right directions. To Disconnect the Application from the device, the user has to press "Disconnect".

This entire system is powered using a 12V/4.5Ah battery. The power supply and Charging section of the system contains a step-down transformer of 230/12V, used to step down the voltage to 12VAC. To convert it to DC, a bridge rectifier or diode is used. The capacitive filter is used which makes use of a 7805 voltage regulator to regulate it to +5V DC power will be needed for the microcontroller, LCD display, and Bluetooth module to operate, to remove ripple. The capacitive filter is used which makes use of a 7812 voltage regulator to regulate it to +12V DC power will be needed for the DC motors.

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CHARACTERISTICS OF BUTT JOINT PRODUCED BY FRICTION STIR WELDING PROCESS

Dr D. Santharao, M. Jayaram, M. Harish, M. Anil Kumar

Abstract : The welding is the process of joining similar metals and dissimilar metals by melting the material with or without the use of filler material. Aluminum alloys are the major applications in welding process like aerospace industries, ship building industries. Friction stir welding is a novel technique for production of joints in solid state. The various process parameters are spindle speed, feed, load and geometry of the tool. The joining of similar Aluminum Alloys was carried out using friction stir welding (FSW) techniques are rotational speed, transverse speed, tool geometry. In this process aluminum alloy butt joint are prepared using Friction stir welding with varying process parameters are rotation speed, transverse speed by keeping constant load and tool geometry. The mechanical properties such as tensile strength, hardness and impact strength were evaluated. The microstructures of joints were analyzed using optical microscope and scanning electron microscope. The corrosion properties were also analyzed by using salt spray corrosion test

KEYWORDS: CONICAL PLANE TAPERED TOOL, TENSILE STRENGTH, IMPACT STRENGTH, HARDNESS, MICROSTRUCTURE, CORROSION RESISTANCE, FRICTION STIR WELDING.

1. INTRODUCTION

Friction stir welding (FSW) is a relatively new joining process that has been used for high production since 1996. Because melting does not occur and joining takes place below the melting temperature of the material, a high-quality weld is created. This characteristic greatly reduces the ill effects of high heat input, including distortion, and eliminates solidification defects. Friction stir welding also is highly efficient, produces no fumes, and uses no filler material, which make this process environmentally friendly.

The joining of similar Aluminium Alloys was carried out using friction stir welding (FSW) technique and the process parameters were optimized using Taguchi orthogonal design of experiments. The rotational speed, transverse speed, tool geometry and ratio between tool shoulder diameter and pin diameter were the parameters taken into consideration.

The optimum process parameters were determined with reference to tensile strength of the joint. The predicted optimal value of tensile strength was confirmed by conducting the confirmation run using optimum parameters. This study shows that defect free, high efficiency welded joints can be produced using a wide range of process parameters and recommends parameters for producing best joint tensile properties.

The other properties like hardness, impact strength, corrosion of the welded joint will be estimated. The joining of similar Aluminium Alloys was carried out using friction stir welding (FSW) technique and the process parameters were optimized using Taguchi orthogonal design of experiments. The rotational speed, transverse speed, tool geometry and ratio between tool shoulder diameter and pin diameter were the parameters taken into consideration. The optimum process parameters were determined with reference to tensile strength of the joint. The predicted optimal value of tensile strength was confirmed by conducting the confirmation run using optimum parameters. This study shows that defect free, high efficiency welded joints can be produced using a wide range of process parameters and recommends parameters for producing best joint tensile properties. The other properties like hardness, impact strength, corrosion of the welded joint will be estimated.

2. IDENTATIONS

FABRICATION AND EXTRACTION OF FUEL FROM WASTE PLASTIC

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Abstract- *The present work includes the combination of fuel extracted from the plastic by the catalytic pyrolysis process of waste plastic. The catalytic pyrolysis includes the degradation of the plastic material by applying heat without the presence of oxygen and with the presence of catalysts. This study results in producing an oil sample from the waste plastic. The produced oil sample subjecting to study the fuel properties, calorific value, viscosity, and reaction temperature. On the basis of results achieved by the study, modification of the catalyst and reaction conditions was done. Finally, the produced fuel is analyzed. High density polyethylene (HDPE) pipes are used as a source of waste plastic. The catalyst is used for the process of pyrolysis. The pyrolysis reaction was brought at polymer to catalyst ratio of 4:1. The temperature in the reactor ranges between 400^0 C and 500^0 C.*

Keywords: **Pyrolysis, Extraction of fuel, Plastic, Catalyst.**

1. INTRODUCTION

Now a days, it is very common that plastics are changing to be dangerous. Very soon, the earth is going to be covering completely with plastics and people will live over it. The allegations on plastics finally proved that plastics are hazardous and non-biodegradable in nature. The disposing and decomposition of plastic is very difficult, it is undergoing many researches in this regard. Some methods are used now for Now-a-days, it is very common that plastics are changing to be dangerous. Very soon, the earth is going the disposal of plastic are mechanical recycling, biological recycling, chemical recycling, and landfilling. Recently, known that the chemical recycling earning much interest and also found that the products formed in a chemical recycling process are more advantageous.

Plastic is such a material that has been using extensively. It is referred as the greatest innovation of the world. There are many number ways in which plastic can be used. It has a very extensive market since it is lightweight, cheap, reusable, flexible, do not rot and do not rust. Because of this, the production of plastic is gone up nearly 10% per annum since 1950. Asia holds the record of world's largest consumer of plastic with 36.5% of the global consumption.

The use of plastic is extremely large and has been increasing day by day in the view of advantages derived from adaptability, relatively low cost, endurance (due to their higher chemical stability and low degradability). Most of the plastics are polyolefin (polyolefin, which is made from the olefin propylene) such as polyethylene and polypropylene, which have enormous production and use in many applications such as packaging, electricity, building, agriculture, and health care. The property of high ductility cause disposition of waste plastics a very serious environment headache, land filling being the most recycled dispositioned way. The plastic wastes can be divided as municipal and industrial wastes just as to their influences; these groups have different qualities and properties and are subjected to different management strategies.

2. LITERATURE REVIEW

A ton of research has been done in noncatalytic and synergist pyrolysis of plastics which demonstrates that plastics waste can in reality be changed over to helpful synthetic feedstock. The works uncover that the item appropriation can be influenced by various parameters which incorporate the polymer source (plastic sort), impetuses utilized, size of the

DESIGN AND FABRICATION OF SUGARCANE HARVESTING MACHINE

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Abstract: This project is focused on the development of sugarcane harvesting machines. Now a days there is a need of fast production of agriculture products. 75% of Indian economy is based on agriculture. So, development of the agriculture field is considered as development of India. But now a days because of the industrialization, shortage of labour found in agriculture field. Day by day labour demands and their salary also increased. This project is a small work towards analysing sugarcane harvester machine aspects for economical harvesting which will help to minimize the working fatigue and to reduce labour cost. Today's world there is a heavy demand for sugar and its by-products. The major states growing sugarcane are Maharashtra, Uttar Pradesh and Karnataka. Now India is the leading producer of sugarcane in the world.

This paper aims to reduce labour as well as formers effort and to increase the output of agriculture products. If compare to other harvesting machines, this machine can cut the two-side from the lower and upper portion of the sugarcane with reasonable cost. Middle class formers are not able to buy a high cost machines. Hence, we are reducing the cost and size of the machine and reduce the effort on formers.

Index Terms – Design and fabrication of sugarcane harvesting machine, Low cost sugarcane cutting machine, fabrication of sugarcane harvesting machine.

I. INTRODUCTION

Sugarcane is harvested by mechanical harvester which moves along the rows of cane removing the leafy tops of the cane and cutting the stalk into short pieces or "billets". Billets are loaded into bins which are towed alongside the harvester. When full, the bins are taken by road or tramway to the sugar mill. The field capacity of mechanical cane harvesters varies with the size 2.5 to 4 ha per day of 8 hours. Harvesting is done based on maturity group. Farmers who grow a particular variety are usually conversant with the harvesting time. Even most sugar factories give cutting orders to formers based on crop age. This is not a scientific method since, planting time, crop management practice, weather conditions etc influences the maturity.

Sugarcane is an oldest crop known to man, it requires maximum number of labours, more time consuming and it also requires more money. In sugarcane harvesting process we face a lot of problems and those problems are difficult to solve manually. So, that this machine helps to reduce the effort on former, reduce the consuming of time, and also reduce the cost of labour. The design of this sugarcane harvesting machine is very simple and no skilled workers are needed to operate this machine.

II. LITERATURE REVIEW

Dr. Sharad S. Chaudhari [1] There project aimed at designing and fabricating small scale sugarcane harvester for sugarcane harvesting to reduce farmer's effort and to increase production of agricultural products. Machine consists of petrol engine and different mechanisms. When compare to manual harvesting by using this machine has capacity to cut canes in faster rate and it is economical. The machine is helpful for bot.

Prof. N.M. Pachkhand [2] in today's world there is a need for faster rate of production of agricultural products. Agriculture is the backbone of India. In India almost all farmers facing problems of labour shortage. Day by day labour wages are increasing and in the same way demand of agriculture products are also increasing and today's world need faster rate of production of agriculture products. This project aims to design and fabricate small scale sugarcane harvesting machine to reduce farmer's effort and to increase production of agricultural products. This machine consists of petrol engine with different mechanisms. When compared to manual harvesting this machine has a capacity to cut canes in faster rate and it is economical

Samaila [3] Sugarcane harvesting is a labour concentrated operation and its mechanization is a modern development in Nigeria. The difficulties in providing the needed spare parts for the imported harvesting machines and labour shortages during harvesting periods hamper the country's drive towards self-reliance in sugar production. To develop an effective and efficient machine for harvesting of sugarcane, a preliminary data on the energy requirement for the cutting and topping of sugarcane must be available for that a simple apparatus was developed to calculate the energy requirement for cutting and topping of sugarcane.

DESIGN AND FABRICATION OF THERMOELECTRIC REFRIGERATOR USING PELTIER MODULE

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Abstract: In this project, we are excluding the Conventional mechanical components to avoid vibrations, noise, and pollution due to harmful refrigerants from the existing mode of refrigeration systems. Instead of these components, we are using the Peltier module to produce the Refrigeration effect and thereby protecting the environment. It is compact, light in weight, high reliability. A Peltier module with water blocks is more efficient than using Peltier module with the aluminium heat sink(fins). In this project, we are using three layers concept i.e., Iron casing, Thermocol insulation and Aluminium cabin which acts as a cooling chamber. As per our knowledge, it is one of the most cost-effective, clean and environment-friendly systems to preserve food items, medical applications, and other different things that can be stored in it and It also acts as a portable refrigerator.

Index Terms **– Peltier module, Refrigeration, Water blocks.**

I. INTRODUCTION

There are several types of Refrigeration systems that are designed to produce cooling. Thermoelectric refrigeration is a new alternative method. Thermoelectric cooling is also known as "The Peltier Effect". The main objective of our project is to produce the cooling effect by using the "Peltier Module" by the application of water pockets. By using this type of Refrigeration system, we are avoiding the conventional mechanical devices, usage of harmful refrigerants and usage of green-house gases thereby protecting our environment.

In thermoelectric materials, electrical energy can be directly converted into thermal energy and thermal energy into electrical energy. Direct conversion between electrical and thermal energy is possible because of two important thermoelectric effects: The See-beck effect and the Peltier effect. When a circuit of two dissimilar metal and two junctions are formed, a current will flow between the junction or the circuit. This phenomenon is known as the see back effect. C. Peltier, a French watchmaker, and an amateur scientist discovered a reverse effect of the See back.whenever electrical current flows through two dissimilar conductors, depending on the direction of current flow, the junction of the two conductors will either absorb or release heat it is known as "Peltier Effect".

The thermoelectric modules are made of several P-type and N-type semiconductor couples which are electrically connected in a series configuration and thermally in parallel to create cold and hot surfaces. The heat pumping direction can be altered by altering the polarity of changing DC current. Heat will be rejected through the module from the inner side to the outer surface. The inner module face will be cooled while the outer face is simultaneously heated. Although they are less efficient than the vapour compression system, they are very light, low in cost, silent in operation, and are Eco-friendly. Usually, TEC's refrigeration will work by using the Aluminium Heat-sink and cooling fans. But, in our project, we used water pockets for the TEC's refrigeration to improve the efficiency of the system.

II. OBJECTIVES

The main purpose of this project is to analyse the working of thermoelectric Refrigerator in addition to water-block. The Scope of this work includes:

- Study of the principles, working of Peltier refrigerator and its working and performance parameters
- Exploring methods to improve the efficiency of the Peltier cooling systems and study the advancement in the field of thermoelectric
- Studying water blocks, which improves the Refrigeration effect and to increase the life span of the Peltier module
- To increase the cooling rate of the Peltier module with water blocks by constructing three layers such as metal, thermocol, and aluminium sheets for better cooling
- Here, we are using a surge tank to provide working fluid i.e., Pre-cooled water, normal tap water or any other coolant.
- We are using hydraulic pumps to improve the flow of working fluid in the circuit to improve the performance of the refrigerator
- To provide a cooling system in rural areas and also to reduce the overall cost of refrigeration to cool water and also to use in medical applications

MANUFACTURING OF BRICKS FROM HDPE AND PP PLASTIC

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Abstract: Our surroundings got a lot of waste generated especially from plastic and that too one time used plastic which resulted in polluting our own habitat. As mechanical engineering students we were jolted by watching the huge amount of impact this waste plastic is creating and then we decided to give this problem a solution in our style by giving it a mechanical touch. That is when we decided to manufacture bricks from this waste plastic which can be used in those particular applications depending upon the need of hour. This project experiments on composition of plastic in creating those bricks from waste plastic. This project mainly uses plastic waste of HDPE (high density polyethylene) and PP (poly propylene) for recycling. Heated up to their plasticity zone and then transferred into a mould and compression force is applied to attain the final product of high quality brick. By using different moulds we can obtain different sizes of the plastic bricks depending upon the size of it, which are then tested for Compressive strength, Impact load and Absorption of water.

INDEX TERMS - PLASTIC WASTE (HDPE AND PP), COLLECTING, SHREDDING, HEATING CHAMBER, MOULD, HYDRAULIC COMPRESSION, PLASTIC BRICKS.

I. INTRODUCTION

The first commercial plastic was developed over one hundred years ago, but the plastic became major consumer material only after the growth of the petrochemical industry in the 1920s. Now plastic have not only replaced many wood, leather, paper, metal, glass, and natural fibre products in many applications, but also have facilitated the development of entirely new types of products that are so versatile in use that their impact on the environment are extremely wide ranging.. Careless disposal of plastic bags chokes drains, blocks and porosity of the soil and cause problems for ground water recharge. If treated correctly, this resource can become the beginning of something new for you, society and the planet at large. This resource lying around everywhere can be useful for source of income to our community. There is good opportunity of plastic waste to eliminate plastic pollution, reducing the demand for new plastic products and closing its materials loop while creating better livelihoods for people around the world.

1.1 Plastic

Plastics are typically organic polymers of high molecular mass and often contain other substances. They are usually synthetic, most commonly derived from petrochemicals, however, an array of variants are made from renewable materials such as polylactic acid from corn or cellulosics from cotton linters.

1.2 Types of Plastic

1. PET (polyethylene terephthalate)
This is a strong plastic and it is easily seen by its transparent look. They are used as bottles, jars and spray bottles. The items made from this plastic are commonly recycled.

2. HDPE (high density polyethylene)
This plastic is very strong in nature and used for food or drink containers. Some of the items made from this plastic include shampoo bottles, oil bottles, soap bottles and bleaches. This plastic has good moulding properties.

3. PVC (polyvinyl chloride)
These plastics are most commonly used for plumbing pipes and it is very toxic when heated up.

4. LDPE (low density polyethylene)
Plastic bags, Trays, squeezable bottles, and snap-on lids are made from LDPE. Usually this plastic works well with recycling.

5. PP (polypropylene)
These plastics are easily available in the markets. This plastic is strong and can usually resist higher temperatures. These are widely used for products like Plastic chairs, syrup bottles etc. It also works well with recycling.

6. PS (polystyrene)
PS is also known as Styrofoam and it is recyclable, but not efficiently and recycling takes a lot of energy. Disposable cups, plastic food boxes and packing foam are made from this plastic.

7. Other (Mix)
This code is used to identify other types of plastic that are not defined by other six codes which are mentioned above. ABS, Acrylic is included in this category and it is more difficult to recycle.

DESIGN AND ANALYSIS OF HYBRID ELECTRIC GO-KART

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Abstract: The enormous increase in fuel consumption from ages in the automobile area causes the exhaustion of fuel reserves and deficiency for future generations. An increase in the global warming temperatures by the emission of the pollutants from the conventional drive systems can cause a grave problem in the future. This challenging situation requires hybrid vehicles to subdue this problem. A hybrid electric go-kart vehicle is a type of hybrid vehicle that combines the traditional electrical propulsion system and internal combustion engine in the go-kart and provides increases in the competence of the formal drives and the conserve in the fuel economy. The sight of an electric propulsion in the kart vehicle involves more wide-range of fuel-efficient than the formal vehicle propulsion systems. The main intention of the project is to design the hybrid go-kart in the diminutive which is eco-friendly, comfortable and provides safe driving exposure to people and racers and also to a more enhanced fuel-efficient go-kart than the conventional Go-karts that run on electric drive and IC engines system. In this kart, cradle frame body intended and the IC engine gives a mileage of 50km/l and brushless dc motor gives a distance of 45km

***Index Terms*– Brushless DC Motor, Conventional Go-Kart, Cradle Frame Electric Drive, Hybrid Go-Kart.**

I. INTRODUCTION

Traditional vehicles with Internal Combustion engines afford good performance characteristics and long operating range by appropriating the high-energy-density benefits of petroleum fuels. But, traditional IC engine vehicles have the limitations of lower fuel-saving and environmental pollution. Battery-powered EVs, on the other hand, possess some improvements over standard Internal Combustion engine vehicles, such as high-energy efficiency and zero environmental pollution. The analysis particularly the working range per charge, is significantly minor competitive than IC engine vehicles, due to the much more dwindle energy density of the batteries than that of petrol, due to the much more moderate energy density of the batteries than that of petrol. Hybrid electric vehicle uses two energy sources and have the aid of both the IC engine and Electric Vehicles and subdue their limitations.

1.1 Hybrid Technology

A hybrid vehicle unites two systems for the propulsion of a vehicle. Desirable combinations include electric and petrol, battery and fuel cell. One energy source is for a depot, and the other is a changeover of fuel to power. The mixing of two energy sources may support two different propulsion systems. The hybrid vehicles are classified as follows.

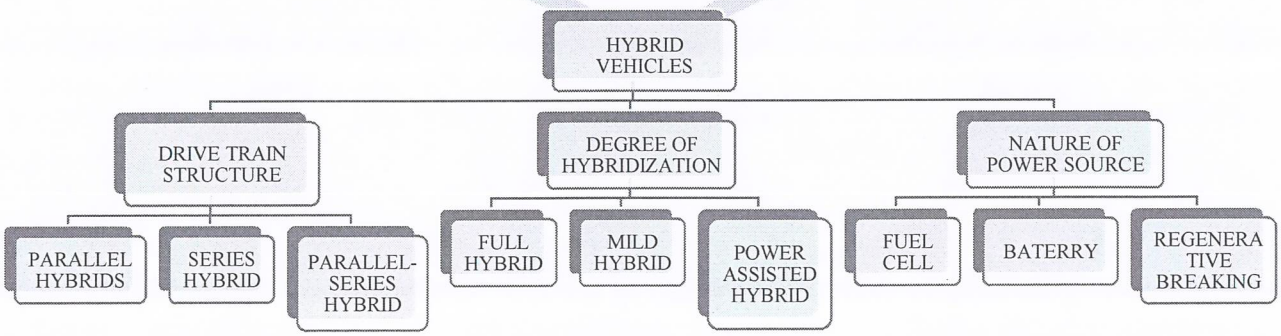

Fig.1.1 (a) Assortment of Hybrid Vehicles

We are acknowledging the parallel hybrid technology for our hybrid electric Go-kart project and it has outlined below:

1.1.1 Parallel Hybrid Vehicle

The parallel hybrid vehicle is one of the most significant and commonly used types in hybrid vehicles and it is more fuel-efficient than the other traditional systems. And it is a combination of the electric drive train and the internal combustion engine. Initially, for the low starting torque, the Internal Combustion engine is used for some time and then to get high torque and to save

FABRICATION OF MOTORIZED AGRICULTURE WEEDER WITH GRASS COLLECTOR

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Abstract: In India, most of the people are farmers and agriculture is the backbone of India. Crores of rupees are spending in agriculture, but due to weeds, the yield of the crops was drastically falling down. Even though there are losses with insects, worms and from diseased crops. As compared to all these losses, loss due to weeds is high. Most commonly weeds are always grown at where they are not necessary. In our project work we design and constructed a motorized agriculture weeder with a grass collector to remove and collect the weeds and waste material present between crops. The compelling structure of the weed expelling machine is to limit the time taken for evacuating weed present between the developing plants. The agriculture weeding machines are accessible in the market at different kinds; however, those are expensive and exorbitant to farmers and to work those machines requires a talented individual. There are weeds and undesired plants on the field which devours the nutritious components which are planned for the harvest that will be developed in the field. Right now, we have planned a weeding vehicle to remove and clean the undesirable grass and weeds. This weeder works by a high torque dc motor that is controlled by a battery.

INDEX TERMS: Base Frame, Battery, Cutting, Drilling, Dual Axis Electrical Motor, Welding, Wheels Grass Collector.

I. INTRODUCTION

India is a developing country; it requires new inventions and techniques for efficient developments. The economic developments in the agricultural sector of India have quite more opportunities for research to develop effective machines for the betterment of the farmers. The weeds are one of the reasons for the failure of crop production and based on weeds should be controlled. There are various methods used in the process like chemical, mechanical biological, etc. every single method has its benefits and drawbacks, mechanical weeding is widely used because of its benefits. The demand for quality food is very huge in the market, now a day people are ready to pay an extra amount if the quality is assured. To achieve a high yield crop production new method is to be implemented for the removal of the unwanted weed in the crop. The major problem is the weed grow along with the crop; the nutrients are provided to the crop are taken by the weeds grown in between crops. weed takes advantage of the nutrients, the crop becomes weak and the weed becomes rich in nutrients and gets strength. To eradicate this problem, the weed is to be removed.

To solve this problem, we have fabricated a weed removing machine with Dc motor, we modified the machine by taking a single axis Dc wiper motor and we fabricated it to dual-axis motor. it works with a connection to the battery. a weed collector is arranged to collect the weeds grown in between the crop. we have converted the rotary motion of the motor into linear motion by using a second class of lever, and we also provided the sliders to the frame to adjust the horizontal and vertical height based on the comfort and height of the operator. The existing weeders are operated by using engine, even though they are efficient they are unaffordable and produce so much pollution to environment, for that reason we have improved the weeder to work with Dc motor and feeds power from battery and also we have arranged a grass collector at the bottom of the weeder which collects the grass and waste materials.

II. OBJECTIVES OF STUDY

a) The main objective of our project is to construct and test the motorized agriculture weeder.
b) Generally, humans and animal power are used to control the weeds but we have developed a mechanical weeder.
c) To limit the time consumption for weeding, we introduced mechanical weeder.
d) To understand the conditions under which the weed competition is high so that we can control the weeds.
e) Providing the linear and vertical height adjusting slider to facilitate the operator to adjust the frame as per his height

III. COMPONENTS OF AGRICULTER WEEDER

3.1 FRAME

In our motorized agricultural weeder, the frame is made up of hollow square pipes and these pipes are made up of mild steel. Other accessories like Dc motor, wheels, grass collector, the battery mounted on it. The motor is mounted at the front end of the body and the handle is connected at the rare end of the body. The cutting edge is connected to the motor at the front side.

MECHANICAL PROPERTIES EVALUATION OF HYBRID POLYMER COMPOSITES WITH BAMBOO AND E-GLASS FIBER PRODUCED BY HAND LAY-UP PROCESS

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Abstract

High exploitation rates and low recovery rates quickly deplete global natural resources, increasing the risk of global warming and pollution. In recent years, the development of polymer composites Reinforced with natural fibers such as jute, bamboo, linen, sisal, hemp, and the coir has become increasingly important. Natural fiber, commonly used in most parts of the world, requires minimal financial input and maintenance. Environmentally friendly and economical for polymer composites reinforced with synthetic fibers. However, composites reinforced with natural fibers have low water absorption and may not meet the requirements of specific applications. Due to this problem, natural fibers can be combined with synthetic fibers having the same matrix material to obtain the greatest advantage in improving its properties. In this case, hybrid composites made from natural fiber and fiber-reinforced polymer composites are very important for current needs. This article discusses the mechanical properties of bidirectional bamboo reinforced fibers and epoxy hybrid composite elements. Mechanical properties such as impact strength, flexural strength, and moisture absorption are evaluated experimentally following ASTM standards. Conclusions are drawn from the results of the experiment.

Keywords: bamboo, fiberglass, epoxy.

1. INTRODUCTION

The worldwide interest for wood as a structural material is consistently developing, while the accessibility of this common asset is decreasing. This circumstance has prompted the advancement of elective materials. Of the different engineered materials that have been 'investigated and supported, polymer composites guarantee significant cooperation as building materials. There has been a developing enthusiasm for using common strands as a fortification in polymer composite for making ease development materials as of late. Characteristic filaments are imminent strengthening materials and their utilization as of not long ago has been more conventional than specialized. They have since a long time ago filled numerous valuable needs however the use of the material innovation for the use of normal filaments as a fortification in polymer network occurred in nearly late years. Financial and other related factors in many creating nations where regular strands are rich interest that researchers and specialists apply fitting innovation to use these normal filaments as adequately and monetarily as conceivable to deliver great quality fiber fortified polymer composites for

DESIGN AND FABRICATION OF MULTI PURPOSE MACHINE

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ABSTRACT :

This deals with design, development and fabrication of MULTI PURPOSE MACHINE. This machine is designed for the purpose of MULTI PURPOSE MACHINE i.e; DRILLING, CUTTING AND GRINDING operations.

Industries are basically meant for production of useful goods and services at low production cost, machinery cost and low inventory cost. So in this project we have proposed a machine which can perform operations like cutting, drilling, grinding operations at one place simultaneously.

This machine is based on the mechanisam of withworths return mechanisam. The machine perform multi purpose operation at same time and automatic which is controlled or operated by motor which is run with the help of current. It can be used in small industries, workshops to work upon wood blocks, steel and pvc materials.

The machine motor not required high power voltage. The prices of drilling, cutting and grinding machine are so high and some are not portable, so we can try to made the multi purpose machine which are portable.

Key words: cutting, drilling, grinding.

INTRODUCTION:

Industries are basically meant for production of useful goods d services at low production cost, machinery cost and low inventory cost. Today in this world every task have been made quicker and fast due to technology advancement but this advancement also demands huge investments and expenditure, every industry desires to make high productivity rate maintaining the quality and standard of the product at low average cost in an industry a considerable portion of investment is being made for machinery installation. So in this paper we have proposed a machine operations like cutting, drilling, grinding, some lathe operations at different working centers simultaneously which implies that industrialist have not to pay for machine performing above tasks individually for operating operation simultaneously.

Multipurpose machine or MPM as we call it is a machine i.e; made especially for the small scale industries where labours working are have very little technology. MPM it is a machine that performs their work quickly and efficiently without the hassle of using different machines for performing different operations on workpiece. It has three arms on which three different operations are performed. This project is focused on design and fabrication of multipurpose machine assembly by using CATIA design software.

WORKING :

The multi purpose machine (drilling, cutting, grinding) consists of machining tools like driller machine, grinding machine, hack saw blade. This machine consists of two vices arranged on frame. Therefore processes like drilling, cutting and grinding can be done. Vices are mounted to the processing machines. One vice is left free for loading and un loading the work pieces. All these are fixed to a frame. A motor is fixed which is connected to chain to shafts so that all processes can be driven by a single motor. The tools in turn are connected to a motor by means of a chain and pulley mechanism. The motor rotates all the three tools rotate simultaneously. The workpiece is loaded in the vice. When it is at the right position the table is locked with the help of locknut and the

DESIGN AND FABRICATION OF KINETIC ENERGY RECOVERY SYSTEM THROUGH MECHANICAL BRAKES

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Abstract: As the basic law of Physics says 'energy can neither be created nor be destroyed it can only be converted from one form to another'. During huge amount of energy is lost to atmosphere as heat. It will be good if we could store this energy somehow which is otherwise getting wasted out and reuse it next time we started to accelerate. Regenerative braking system through mechanical brakes refers to a system in which the kinetic energy of the vehicle is stored temporarily, as an accumulative energy, during deceleration, and is reused as kinetic energy during acceleration or running. Kinetic energy recovery braking is a small, yet very important, step toward our eventual independence from fossil fuels. These kinds of brakes allow batteries to be used for longer periods of time without the need to be plugged into an external charger. These types of brakes also extend the driving range of fully electric vehicles. This system is completely designed and kinematic analysis in 3D EXPERIENCE.

1. INTRODUCTION:

When a conventional vehicle applies its brakes, kinetic energy is converted to heat as friction between the brake pads and wheels. This heat is carries away in the airstream and the energy is effectively wasted The total amount of energy lost in this way depends on how often, how hard and for how long the brakes are applied.regenerative braking system refers to a process in which a portion of the kinetic energy of the vehicle is stored by a short term storage system. Energy normally dissipated in the brakes is directed by a power transmission system to the energy store during deceleration.

That energy is held until required again by the vehicle, whereby it is converted back into kinetic energy and used to accelerate the vehicle. The magnitude of the portion available for energy storage varies according to the type of storage, drive train efficiency, drive cycle and inertia weight. A lorry on the monoway could travel 100 miles between stops. This represents little saving even if the efficiency of the system is 100%. City centre driving involves many more braking events representing a much higher energy loss with greater potential savings. With buses, taxis, delivery vans and so on there is even more potential for economy. Since regenerative braking system results in an increase in energy output for a given energy input to a vehicle, the efficiency is improved. The amount of work done by the engine of the vehicle is reduced, in turn reducing the amount of prime energy required to propel the vehicle. In order for a regenerative braking system system to be cost effective the prime energy saved over a specified lifetime must offset the initial cost, size and weight penalties of the system.

The energy storage unit must be compact, durable and capable of handling high power levels efficiently, and any auxiliary energy transfer or energy conversion equipment must be efficient, compact and of reasonable cost. In this chapter discussed about the project background such as problem statement, objectives and scope of the project. All this information is crucial to give a starting point for the progress in this project. This project is focused on design and fabrication of regenerative braking system through mechanical brakes assembly by using CATIA design software.

In society day by day the automobile sector is developing very huge. In India present economy is depend on the automobile sector. While manufacturing the automobile components consider the following parameters

- Design parameters
- Safety parameters
- Cost of reduction
- Weight reduction
- Power generation after applying brakes
- Fuel consumption
- Easy fitment
- Time factor

DESIGN OF IC ENGINE GO-KART AND ANALYSIS OF ITS CHASSIS

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ABSTRACT: The Go-kart is a four-wheeled vehicle without any suspension and differential. It is a light-weight vehicle designed for racing used for racing. Go-kart has low ground clearance in comparison to the other vehicles. The parts of go-kart are engine, wheels, steering, axle and chassis. Go-kart is powered by 125 cc engine.

We are going to use software like CATIA V5 for CAD modelling and ANSYS for analysis. In this project, we will work on the design of chassis, braking system, steering assembly and power transmission and analysis of the Chassis. For the safety point of view, analysis is carried out for a range of force values for all three impact tests like Front impact, Rear impact, Side-impact.

Keywords: Design and ANSYS, Go-Kart, IC Engine.

I. INTRODUCTION

In 1956, Art Ingels an American motorcar builder with his neighbour, Lou Borelli, created the world's first go-kart. The go-kart made its debut on 14 September 1958 when Ingels drove it round the pits in Pomona where an automobile race was taking place. McCulloch became the primary company to supply engines for karts in 1959. The original model was the McCulloch MC-10 and was adapted from a two-stroke chainsaw engine.

Go-kart could be a simple four-wheeled, lightweight, single seated vehicle. Go-kart is without suspension and differential. Go-kart is typically used for kart racing, off-road driving, desert racing, and short distance travel and fun.

Go-kart usually consists of a chassis, engine or motor, steering system, braking system. During this project, our team designed the parts of the Internal Combustion Engine Go-kart like chassis, steering wheel, steering shaft, stub axle, front axle, rear axle, sprocket wheel in CATIA Software and performing analysis of front impact load, rear impact load and side-impact load on the chassis in ANSYS Software.

TYPES OF GO-KARTS

1. Internal combustion engine Go-kart
2. Electrical go-kart
3. Hybrid go-kart

II. DESIGN PROCESS

2.1 DESIGN OF CHASSIS

Chassis is the mainframe of a vehicle made of hollow pipes, where it houses the other components like engine, steering system, transmission system. This chassis has been designed with taking factors like dimension limits like width, length.

CHASSIS SPECIFICATIONS

CHASSIS	
Material	AISI 4130 (Chromoly)
Diameter	1 in
Wheel Base (L)	36 in
Front track width (B)	30 in
Rear track width (B_t)	33 in

FABRICATION AND ANALYSIS OF SINGLE BASIN DOUBLE SLOPE SOLAR STILL WITH FINNED SURFACE

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ABSTRACT:

It is found that Solar distillation systems economically feasible in desalination of saline water. A solar distillation system is cost-effective and simple technology. Free of cost, non-polluting type solar energy is used to produce distilled water. The present work shows that high grade energy savings is possible with use of different efficiency enhancement techniques for solar stills. Experimentation is total carried out total five days in a month march 2020 from 1st march to 6th march compared to the efficiency of simple solar still single basin double slope solar still with finned surface efficiency is more simple solar still gives 1L pure water from the 6L of saline water in 7 hours but this will gives 5L of pure water from 8L of saline water in 5 hours the cost of the equipment is also less as compared to the other aqua technics. The operational cost is also less.

Key words: Solar Energy, Solar Still, Finned Surface.

Introduction:

Solar distillation is a relatively simple treatment of brackish (i.e. contain dissolved salts) water supplies. Distillation is one of many processes that can be used for water purification and can use any heating source. Solar energy is a low tech option. In this process, water is evaporated; using the energy of the sun then the vapour condenses as pure water. This process removes salts and other impurities. Solar distillation is used to produce drinking water or to produce pure water for lead-acid batteries, laboratories, hospitals and in producing commercial products such as rose water. It is recommended that drinking water has 100 to 1000 mg/l of salt to maintain electrolyte levels and for taste. Some saline water may need to be added to the distilled water for acceptable drinking water. Solar water distillation is a very old technology. An early large-scale solar still was built in 1872 to supply a mining community in Chile with drinking water. It has been used for emergency situations including the navy introduction of inflatable stills for lifeboats. There are a number of other approaches to desalination such as photovoltaic powered reverse osmosis, for which small-scale commercially available equipment is available; solar distillation has to be compared with these options to determine its appropriateness to any situation. If treatment with polluted water is required rather than desalination, slow sand filtration is a low-cost option.

METHODOLOGY EXPERIMENTATION:

EXPERIMENT LOCATION:

The experiment is carried out at Rajamahendravarm, Andhrapradesh, india. It has exceptionally hot &dry during summer with temperature reaching as high as 30^0C.

All the observations and readings on experimental setups are taken in the month of march 2020 from 1st march 2020 to 6th march 2020 The time duration for observations of solar still is from 9:00 AM to 5:00 PM for experimental setups of arrangement of only Black Coating, Black Coating with Finned Surface arrangement .All readings are taken at 2 cm depth of water in Basin so that total 8 lit. of water in inner basin of single basin double slope solar still. Temperature is measured for every 1 hour with the help of infrared thermometer.

DESIGN AND ANALYSIS OF SOLAR HYBRID CHIMNEY

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Abstract :

Solar hybrid chimney, thermo-electric method used for generation of electrical output by the rotation blades of vertical wind turbine placed at bottom center of chimney base. The entire solar hybrid chimney works based on the principles of Chimney effect, the greenhouse effect and the vertical wind turbine. Sun's energy gets absorbed by the flat plate solar collector and transforms energy into heat. This heat energy will be given to air which lies under the solar collector. the air gets heated by the greenhouse effects. The collector being transparent membrane placed at definite height ranging different dimensions from the sea level. The collector is used to improve the air heating process, the chimney promotes the connection between the warm air nearby the surface and the air present in atmosphere and it converts the kinetic energy of heated air into electricity and heated air having low density moves towards chimney due to the low draught pressure developed in the chimney by stack effect. This continuous airflow when collides with turbine-blade at chimney base. The mechanical output drawn from the shaft adjoined to turbine blades will be given to rotor of generation unit for electrical generation. Solar hybrid chimney needed enough land area. A small-scale solar updraft tower may be an attractive option for remote regions in developing countries.

Key words – **greenhouse effect, solar updraft tower, solar collector, continuous air flow.**

1 INTRODUCTION

In many parts of the world, there is a growing awareness that some alternative energy sources could have an important role to play in the production of electricity. However, only the solar energy represents totally nano-polluting inexhaustible energy resources that can be utilized economically to supply human's energy needs for all time.

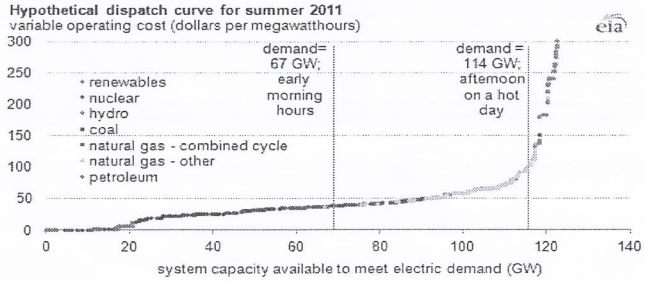
Since 1870's onwards electricity generating system is mainly based on exhaustible fuels such are coal, hydro carbons and uranium, which are damaging the environment and releasing hazardous and harmful gases to the atmosphere. Due to increasing the prices of the limited resources, it being a serious issue even for rich countries.

All the people want to and should be use electricity for future. Hence, the demand for electricity is dramatically increasing day by day. But the resources like coal, oil are very less in earth crust and even nuclear power is also very shortsighted.

A clean inexhaustible source of energy is needed. i.e., The Sun. The solar energy can be used in various direct and indirect forms. It should not need cooling water and is based on environment totally. So, we think about the huge problem that facing by the entire world and decided to design a new and conventional method for generating electric power by using hybrid chimney.

1.1 PRICIPLE OF SOLAR HYBIRD CHIMNEY:

The basic components of the solar hybrid chimney are the collectors, turbine and a chimney. The solar energy radiation is converted into electric power. At the bottom center of chimney, a turbine is placed to convert kinetic energy of air into mechanical energy. The turbine shaft is connected to rotor of the generator, which takes the mechanical energy from the turbine as input and produces electrical power as output. This electrical power generated will be further utilized to meet the demand vs production graph and its urgency such as domestic purposes for lightening the households devices and industrial needs.



Analysis of Shell and Tube Heat Exchanger for Waste Heat Recovery by using CFD

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Abstract: *The heat available in the exhaust section of many energy conversion device such Boiler, Gas turbine, I.C engine etc goes as waste, if properly not utilized. Currently the work has been carried out with a view to assume the performance of a shell and tube heat exchanger in the recovery of waste heat application. The performance of the heat exchanger has been evaluated by using the Computational fluid dynamics package in ANSYS fluent 15.0 and the parameter of performance of the heat exchangers are given in effectiveness, waste heat recovery, logarithmic mean temperature distribution has been reported in this report.*

Key-words- Recovery of waste heat application, Computational fluid dynamics.

I. INTRODUCTION

Energy is a very essential entity for any economic development of any country in this globe [8]. At the current scenario there is a tremendous rapid industrialization growth, which is the main relevant reason for the energy crisis and also for pollution which is causing global warming. As the current scenario, we are widely using Diesel Engine widely used in many industries. Almost 2/3rd of the energy is wasted by the exhaust gas which is directly or indirectly causing global warming overall energy requirement [8]. Depending on the temperature level of the exhaust stream and proposed application, different heat exchanger devices, heat pipes are used combustion equipments has been working to utilize the use of recovered heat. Before, Shell and heat tube exchanger was broadly used as industrial heat transfer equipments. Plain tubes were used during those periods for assembling of the fins. After industrialization, now a day's modified tubes are used for proper exchanging of heat just like the finned tube. Heat transfer coefficient selected for the experimentation are is demineralized water which is higher than gases, which also reduce the size of the heat exchanger.

Demineralized water is mainly used in the purpose of ion exchange, electro deionization, or membrane filtration technologies, which can be more useful for creating an ultrapure water process such as distillation.

Demineralization by ion exchange, electrode ionization or membrane filtration can produce water that is nearly 100% free of minerals and salt including Alkalinity, Calcium, Chloride, Iron, Magnesium, Nitrate, Potassium, Silica, Sodium, Sulphate. Demineralized water can be effective for many things such as Power, Refiner, Petro-chemical and In this section efforts on works done by past researchers on Shell and Tube Heat Exchanger CFD analysis have been discussed.

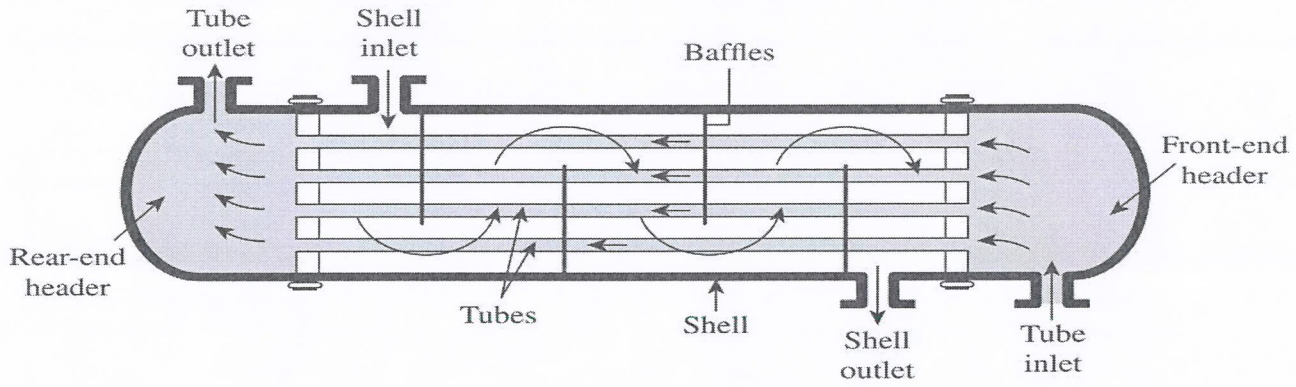

Fig.1 shell and tube heat exchanger

II. ROLE OF HEAT EXCHANGERS

A heat exchanger is a framework used to transfer heat between at least two fluids. Heat exchangers are utilized in both cooling and warming procedures. The liquids might be in direct contact or might be isolated by a strong divider to forestall blending. They are generally utilized in space heating, refrigeration, cooling, power stations, synthetic plants, petrochemical plants, oil treatment facilities, gaseous petrol preparing, and sewage treatment. The extraordinary instance of a Heat exchanger is found in an IC Engine in which a revolving around fluid known as Engine coolant travels through radiator circles and wind streams past the twists, which cools the coolant and warms the moving toward air.

Another model is the warmth sink, which is an aloof heat exchanger that moves the warmth produced by an electronic or a mechanical gadget to a liquid medium, frequently air or a fluid coolant. There are three essential orders of Heat exchangers as indicated by their stream plan. In Parallel Flow heat exchangers is the type of heat exchanger in which different fluids enters in the exchanger from two different sides and traveling in relating to one another to the contrary side. In counter-Flow heat exchangers the liquids enter the exchanger from furthest edges. The counter-current plan is the most proficient, in that it can move the most warmth from the warmth (move) medium per unit mass because of the way that the normal temperature contrast along any unit length is higher. See countercurrent trade. In a cross-flow heat exchanger, the liquids venture out generally opposite to each other through the exchanger. For boosting up the efficiency, heat exchangers are intended to boost the surface territory of the divider

EVALUATION OF BIODIESEL DERIVED FROM WASTE VEGETABLE OILS

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Abstract: *Research on alternative sources of energy is more relevant than ever as the concerns regarding fuels and their aftermath on the environment is blooming. Biodiesel can serve as an efficient alternative to petroleum diesel as it possesses similar properties. It is renewable and environment friendly as well. In this proposed evaluation, we have derived biodiesel from waste vegetable oil. The method we have used for the purpose is Transesterification reaction. We used waste vegetable oil instead of pure oil to promote reuse and recycle of the waste oil. After preparation of biodiesel, we conducted experiments to calculate its flash point, fire point and calorific value and compared it to standard references. Biodiesel produced from waste vegetable oil demonstrated commendable properties.*

Keywords: Biofuel, Biodiesel, Waste Vegetable Oil, Transesterification.

1. INTRODUCTION

An exponential decline in availability of fossil fuel and rise of global warming have led to several proposals to cut back the dependence on fossil fuels. As a result, environmentally friendlier alternatives allowing energy extraction from non-conventional and renewable energy sources (biomass) with a similar efficiency output have been developed. Compared to other renewable energy sources (hydraulic, wave energy, etc.), biomass has the advantage that its chemical structure can be chemically adjusted, generating a product which is constitutionally similar to petroleum and can replace petroleum-derived fuels for transportation purposes. Fuels synthesized from biomass have several advantages such as no sulfur emission and no particulate matter emission during combustion **[1]**.

Transesterification is the chemical reaction that converts a vegetable oil or animal fat to biodiesel by combining oils and fats (included in the ester family) and an alcohol (methanol or ethanol) to make another ester (biodiesel) and another alcohol (glycerine). All the vegetable oils and animal fats used to make biodiesel consists of chemicals called triglycerides. The triglycerides undergo chemical reaction with alcohol to give biodiesel. Waste oil can also be used to make biodiesel. However, these oils contain impurities such as water and food particles that pose special challenges for biodiesel production so proper filtration is required. Transesterification process may be acid-catalyzed or base-catalyzed. The base-catalyzed transesterification of vegetable oils advances faster than the acid-catalyzed reaction. Alkaline catalysts are less corrosive than acidic catalysts as well **[2]**. Because of these reasons, base-catalyzed transesterification was used for the evaluation.

The most common alcohol used for creating biodiesel is methanol. It is terribly fatal in nature and ingesting even a very little amount will cause visual defect or maybe death. Dangerous exposure may also occur from inhalation or skin contact. The reaction to create biodiesel needs a catalyst as well. A catalyst is sometimes a chemical additional to the reaction mixture to speed up the reaction which isn't consumed during the reaction. In biodiesel production, the compound that catalyzes the reaction is named Methoxide which is prepared by dissolving Sodium Hydroxide (NaOH) in Methanol (CH_3OH) **[3]**.

DESIGN AND FABRICATION OF WET AND DRY FLOOR CLEANER WITH IOT BASED CONTROL

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Andhra Pradesh, India.

ABSTRACT:

Cleaning is essential in our daily life. We may not realize that many products used around the houses, colleges and workshops may cause harmful effects. In house hold products there also contains so many of the harmful components that can cause dizziness and respiratory tract irritation. This project is applicable to clean the floors which are wet and dry. Current project work targets to use floor cleaner machine to clean household purpose and office floors. Cleaning is specially carried out by continuous relative motion between scrubber and floor for wet floors and for dry floors vacuum cleaner is used to suck the dry dust. These floor cleaner saves huge cost of labour in future. It reduces the cleaning time and cost effective. It cleans more accurate. This floor cleaner can be modernized by connecting electric and mechanical motors.

KEY WORDS: IOT module, LCD module, Micro controller, Vacuum cleaner, Water pump.

1. INTRODUCTION:

Swachh Bharat Abhiyan or Swachh Bharat mission is nation wide campaign in india for the period 2014 to 2019 that aims to clean up the streets, roads and infrastructure of India cities, towns, urban and rural areas. Small and medium enterprises engaged in manufacturing of cleaning equipment such as rubbers, wipers, twist mops and street brooms have been an up stick of up to 30 percent in business, when Swachh Bharat Mission launched. Business in these sector are upbeat as the mission has given them an breather aim an increasingly stiff competition put up by modern day retail outlets. There is huge demand for cleaning machines for purpose of road, floor cleaning.

Robot is an electromechanical machine and used for various purposes in industrial and domestic applications. Robot appliances are entering in the consumer market, since the introduction of Robot's. Initially the main focus was on having a cleaning device. As the time pass on many improvements were made and more efficient appliances were developed. In early 2010, a new automatic floor cleaner robot "Mint" was developed by Jen Steffen. Detachable clothes were attached for sweeping and mopping purposes. For tracking mint used the GPS-like indoor localization system. In recent years, robotic cleaners have taken major attention in robotic research due to their effectiveness in assisting humans in floor cleaning applications at homes, hotels, restaurants, offices, hospitals, workshops etc. Basically, robotic cleaner are distinguished on their cleaning expertise like floor mapping, dry vacuum cleaning etc. Each cleaning and operating mechanism of robotic floor cleaners has its own advantages and disadvantages. Floor cleaner is a compact robotics system which provides floor cleaning service in room and big offices reducing human labour. Basically as a robot it eliminates human error and provides cleaning activity with much more efficiency. If we clean the floor manually then there is a possibility that the operator will leave some portion of the floor. Also due to manual labour involved this is time consuming and irritating to clean the floor. Also in big offices floor area is very huge and the people involved there for cleaning purpose cannot clean it much more efficiently. This is where the robot comes as an advantage. Also the robot is small and compact in size. So we can carry it and place it wherever we can on the house. Also in

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FABRICATION OF COCOA-BEAN SEPARATION MACHINE

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ABSTRACT

India is an agribusiness based nation and horticulture utilizes over half of our nation's populace, subsequently farming is one of the primary wellsprings of salary for our nation. The principle goal of this undertaking is to help the little scope ranchers solely working in the field of cocoa development. As the ranchers do not have the propelled machines to process their developed cocoa natural product. Our task "plan and manufacture of convenient Cocoa bean isolating machine" can incredibly improve the preparing abilities of cocoa products of the soil the wellbeing of ranchers instead of obsolete strategies utilized for handling. This machine is straightforward in development and minimal, it tends to be made from the parts which are easily accessible. This machine is practical as the work cost is nearly diminished. This machine is exceptionally profitable and explicitly intended to lessen the time taken for division of cocoa beans when contrasted with conventional technique. This machine can be possessed by a gathering of cocoa ranchers who can tolerate the low support cost of this machine.

Keywords: agriculture, cocoa pods, cocoa cultivation, machine design.

INTRODUCTION

Cocoa tree thrives in hot and rainy tropical climates (20 degree north and south of the equator) and predominantly grows in Africa, Asia, Central and South America. Cocoa tree is a small (4 to 8 m height) evergreen tree. In India, it is mainly cultivated in Karnataka, Kerala, Andhra Pradesh and Tamil Nadu mainly as intercrop with Areca nut and Coconut. Slowly the area under cultivation is being promoted by many chocolate producing companies as contract farming. In the survey conducted during the time period 2015-2016, India produced approximately about 17,200 metric tones.

The shell (husk) is a good source of potassium and can be used in the production of potash fertilizer, local soap, biogas ,The beans are ground into powder for making beverages, chocolates, ice-cream, soft drinks, cakes, biscuits, flavoring agents and other products. Cocoa butter, made from the fat extracted from the beans, is a stable fat used in the production of cosmetics and pharmaceutical products.

This study outlines the design of a very efficient, highly productive, cost-effective, ergonomic and environmentally friendly cocoa splitting machine that will be used by cocoa Farmers world - wide to increase and boost productivity and enhance the quality of cocoa products to the highest possible level devoid of any hazards, dangers or perils. This machine can be manufactured from locally available scraps and assembled and maintained at a relatively low cost. Therefore it can be owned patronized by a group of cocoa farmers who can easily bear the low cost of maintenance of the already relative cheap machine.

LITERATURE REVIEW:

Now a days there is no machine to do the process of cocoa pod cutting and cocoa bean separation rural farmers of cocoa farm hence this process is done manually. So major disadvantages of existing method is that, Chance of injuries. The cutting operation is done using knives, and there are many chances of getting injured. Also while separating the beans, penetration of the small cocoa pods particles between the nails and the skin leads to higher pain for the laborers .This method takes more time. It will take about 6 hours for a skilled laborers to cut and separate 100 kg of cocoa beans. So it is time consuming High Labour cost. For separating 100 kg of cocoa beans, it requires two labuor. One for cutting the cocoa pods and other for bean separation. So the labour Cost is high. Physical energy requirement is high.

PERFORMANCE ANALYSIS OF PARALLEL AND COUNTER FLOW HEAT EXCHANGER WITH SQUARE TWISTED PIPE

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ABSTRACT:

Heat exchanger is a device that used to transfer thermal energy(enthalpy) between two(or)more fluids .The transient heat transfer in double tube counter flow & parallel flow heat exchanger was carried out with corrugations on inner tube by twisting the pipe from one end, which give the more swirling motion to fluid flowing through it.

The design of twisted pipe is done by using CATIA V5 software. The mass flow rate is regulated by using rotameters. Thermocouples are placed at inlet and outlet of both cold and hot fluids for measuring the required temperatures. The experimental calculations obtained from the twisted pipe heat exchanger are compared with the normal pipe heat exchanger

Keywords: - Heat exchanger, Twisted pipe, CATIA V5.

1. Introduction:

A heat exchanger may be defined as an equipment which transfers the energy from a hot fluid to a cold fluid, with maximum rate and minimum investment and running costs. In heat exchangers the temperature of each fluid changes as it passes through the exchangers, and hence the temperature of the diving wall between the fluids also changes along the length of exchanger. Examples of heat exchangers intercoolers and preheaters, regenerators, automobile radiators etc.

(i) In a parallel flow heat exchanger, as name suggests, the two fluid streams (hot and cold) travels in the same direction. The two streams enter at one end leaves at the other end. The flow arrangements and variation of temperature of fluid streams in case of parallel flow heat exchanger, are shown in figure. The temperature difference between the hot and cold fluid goes on decreasing from inlet to outlet. Since this type of heat exchanger needs a large area of heat transfer, therefore it is rarely used in practice.

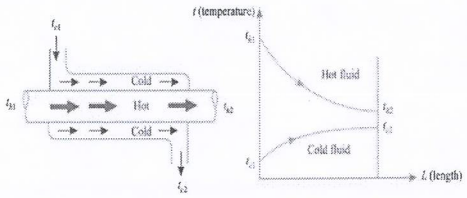

Fig: Parallel flow heat exchanger

(ii) In a counter flow heat exchanger, the two fluids flow in opposite direction. The hot and cold fluids enters at the opposite ends. The flow arrangement and temperature distribution for such a heat exchanger are in shown figure. The temperature difference between the two fluids remains more or less nearly constant. This type of heat exchanger, due to counter flow, gives maximum rate of heat transfer for a given surface area. Hence such heat exchanger are most favored for heating and cooling of fluids.

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DESIGN FABRICATION AND CAMPARATIVE ANALYSIS OF INDUSTRIAL SAFETY HELMET USING GLASS FIBERS REINFORCED WITH EPOXY RESIN

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Andhra Pradesh, India

ABSTRACT

Now-a-days, safety is very important in various on-site industries like manufacturing, construction & power generation industries. To escape the worker from head damage, wearing of industrial safety helmet in on-site industries has become obligatory according to OHSAS 18001[Occupational Health and Safety Assessment Series]. Hence the resisting possessions of safety helmet should be high to hold out against the fortuitous circumstances. This project focuses on scrutinizing and comparing the fabricated industrial safety helmet using composite material which is make by us, with existing industrial safety helmet. The fabricated safety helmet shall be figure out in both practically and theoretically processes. In practical examining the fabricated helmet shall go through the component testing which was specified by BIS 2925 [Bureau of Indian Standards]. In theoretical the results of the practical test will compared in FEA (Finite Element Analysis) using ANSYS 19 R3 software on prototype and existing models. This project talk about the outline of safety helmet constructional attributes, definition, types and choosing of suitable composite material.

Keywords: Industrial safety helmet, FEA, BIS, Composite material, OHSAS

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Electronic copy available at: https://ssrn.com/abstract=3565179

UNMANNED GROUND VEHICLE FOR ARMY SURGICAL OPERATIONS

MR. MOHAMMED ABDUL SHAFEEQ

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RAJAMANDARY.

ABSTRACT

The problem of dismounted operation support with Unmanned Ground Vehicles (UGV) often called robots is widely discussed and many solutions were tested to verify theory and find technological gaps and limitation for such application. In this paper the initial demand and requirements and their evolution is described on an example of Army. Described changes concerns demanded level of autonomy, fire support possibility, possibility of performing combat engineer tasks, using UGV for reconnaissance, surveillance, and target acquisition, longitudinal and lateral stability, obstacle negotiation and overall terrain mobility and efficiency of make use of the "mule".

Keywords: Unmanned Ground Vehicle, Day/Night Surveillance, Arduino.

I. INTRODUCTION

The main principle of our robot is Principle of Humanity based on basic three laws of robotic system. This robot is electromechanical as well as artificial intelligent machine controlled by computer programming. It is designed to replace human beings in various hazardous areas. To overcome the complexity of wired communications, we are using advance wireless IoT technology. The Blynk based control system is used to control the Robot. Similarly, this project mentions about a wirelessly controlled commando robot controlled using radio frequency technology. Military Robots are used to detect bombs, Wireless Camera, Live Human and gas etc. in the war fields. The advantage is that the cost per hour to operate a robot is a fraction of the cost of the human labor needed to perform the same function. Including this, they are reprogrammed and perform functions with a high accuracy. Human operators are far more versatile so they can switch to any pre-defined job tasks easily. Robots are built and programmed to be job specific. Robots are in the infancy stage of their evolution. As robots evolve, they will become more versatile, emulating the human capacity and ability to switch job tasks easily. While the personal computer has made an ineffaceable mark on society, the personal robot

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Mechanical and microstructural behaviour of aluminium/TiB_2 composites fabricated through multi-pass friction stir processing

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ABSTRACT

Friction stir processing (FSP) is a novel solid-state technique developed to refine microstructure and improve mechanical properties. FSP is the most suitable technique for fabricating the surface and bulk metal matrix composites. The aluminum metal matrix composites fabricated using the stir processing technique. The reinforcement particles of titanium diboride (TiB_2) particles were added to aluminum alloy in the solid-state. The mechanical properties of fabricated composites such as tensile and hardness were evaluated. The experimental results found that the tensile and hardness response significantly improved with an increase in the number of passes. The microstructural behavior of composites was carried out using an optical microscope and scanning electron microscopy. It is observed that the TiB_2 reinforcement particles were uniformly dispersed in the matrix material. The observed microstructures have been correlated with mechanical properties.
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1. Introduction

Aluminium Alloys are widely used in aerospace, automotive, and shipbuilding industries due to better strength to weight ratio and corrosion resistance which possess inferior wear resistance. The properties of alloys were improved by addition of reinforced particles to the matrix materials called Aluminium metal matrix composites (AMCs). Recently, application of composites has been increased because of better mechanical and wear properties [1,2]. Traditionally AMCs are produced by liquid metallurgy routes such as liquid casting, electromagnetic stir casting, squeeze casting, laser melt injection, pressure infiltration and in-situ process. It is challenging task in these methods to mix reinforcement particles in molten state of matrix material due to poor wettability of reinforcement particles [3–5]. The other issues are the reinforcement particles tend to react with the matrix material or may decompose at elevated temperatures and more chances are to form undesirable compounds which may deteriorate its mechanical properties of composites.

The friction stir welding (FSW) has been modified into friction stir processing (FSP), this process is most suitable for producing metal matrix composites (MMCs). This new production route attracts various researchers and industries for ease of manufacturing process and product reliability related to liquid casting and powder metallurgy methods. This process can be performed in the solid-state without melting the matrix material and it facilitates refinement of microstructure and improves various mechanical properties. No additional heat energy is required, and the process is considered as green technology as it generates no harmful gases, fumes and less noise while fabrication the composites. There are lesser chances of defects like porosity and air inclusions, which avoid interfacial reactions [6–9].

Several investigations were reported in the past few years about the effect of the addition of various reinforcements as whiskers and fibers such as silicon carbide, titanium carbide, aluminum oxide, silicon di oxide, boron carbide, titanium oxide, carbon Nano tubes, Fly Ash and Graphite etc. on the mechanical performance of AMCs using novel fabrication method. Among the various reinforcements, titanium diboride (TiB_2) is of much interest owing to its high hardness,better stiffness, and wear resistance [8,10–12]. Adem Kurt et al. [9] fabricated composites with silicon carbide particles as reinforcement particles onto the pure Aluminium,

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Improvements in mechanical properties of aluminium alloy-titanium di boride and boron carbide hybrid composite produced through friction stir processing route

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Mechanical properties
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ABSTRACT

Aluminium alloys finds many applications in automotive, aerospace and ship building industries. Among all series AA 5083 alloys are commonly used in ship building industry but possess inferior mechanical properties which are replaced with aluminium alloy composites due to high strength to weight ratio. The present work is focussed to produce aluminium alloy composites with hybrid reinforcement Particles using friction stir processing route. The different proportions of boron carbide and titanium di boride particles are used as hybrid reinforcement particles. The aluminium alloy composites are fabricated by different proportions of reinforcement particles. The properties of fabricated composites such as ultimate tensile strength, micro Vickers hardness and impact strength are evaluated. The mechanical properties are improved and found that highest values of mechanical properties are obtained for 75% TiB_2 + 25% B_4C hybrid reinforced composite. The microstructural evaluations of composites are analysed using optical and scanning electron microscopy. It is found that hybrid reinforcement particles are uniformly distributed in the stirring zone without any micro defects.
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1. Introduction

Friction Stir Processing (FSP) is a solid state technique used for improvement of mechanical properties through plasticization of the metal and alloys in the solid state which is above recrystallization temperature but below the melting of materials. The rotating tool pin of length less than thickness of plate is plunged on to the material and traversed linearly in the material along the specified path. The tool shoulder touches on to the work material generates heat and pin plasticizes as well as mixes the material. FSP can also be used for production of composites in the solid state without melting of material. In the FSP process, the groove is made on the plate and placed the reinforcement particles and stirring is done with tool. The reinforcement particles and matrix material mixes each other and forms composite [1,2]. The various reinforcements such as CeO_2 and SiC [3], WC-Al_2O_3 [4], B_4C, TiB_2, Fly ash [5] etc. were used in processing of composites. Many researchers are done work for production of composites. Nithin Kumar et al. [6] has fabricated AA7005-B_4C-TiB_2 by friction stir processing route and it was observed that the surface hardness, wear resistance and impact strength is increased with hybrid reinforcement of B_4C and TiB_2 in the aluminium alloy. It also found an uniform distribution of reinforcement particles. The ultimate tensile strength also improved with addition of hybrid composites and achieved high hardness value of 150 Hv which has 66% more than base material. M. Nazari et al. [7] has successfully fabricated AA6061-Graphene-TiB_2 using multi pass fsp and led to uniform distribution of the particles and rearrangement of grains onto the matrix material led to tight grain boundaries and found an high hardness and wear resistance N. Yuvaraj et al. [8] has fabricated AA5083-B_4C composites and obtained better mechanical properties. The Ultimate tensile strength and wear rate was 10% more than the base alloy AA5083 with multi pass friction stir processing due to homogeneous distribution of particles and with increase of number of passes. M. Ashjari et al. [9] has fabricated AA5083-Al_2O_3 composites using submerged friction stir processing with threaded tool pin profile and observed that the number of passes reduced the agglomerations and improved mechanical properties. The Hall-Petch effect has shown strengthening mechanism for composites.

Guleria D. et al. [10] reported on bullet resistant material and studied the effect of residual velocity and young's modulus on tar-

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DESIGN AND ANALYSIS OF IC ENGINE I SECTION CONNECTING ROD USING DIFFERENT MATERIALS BY ANSYS SOFTWARE

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Abstract - The connecting rod is the intermediate member between the piston and the Crankshaft. Its primary function is to transmit the push and pull from the piston pin to the crank pin, thus converting the reciprocating motion of the piston into rotary motion of the crank. This describes the designing and analysis of connecting rod. Currently, existing connecting rod is manufactured by using forged steel. In this, drawing is drafted from the calculations. A parametric model of Connecting rod is modeled using SOLIDWORKS software and to that structural analysis is carried out by using ANSYS Workbench Software. Finite element analysis of connecting rod is done by considering the materials, such as Aluminum Alloy, Carbon Steel (AISI 1065) and Grey Cast Iron. The best combination of parameters like Von misses Stress and strain, deformation for two-wheeler pistons were done in ANSYS software. Carbon Steel (AISI 1065) has more strength and less deformation than other material like aluminum Alloy and grey Cast iron. Among of these materials selecting the suitable material for making of piston design.

Keywords- Connecting Rod, ANSYS, SOLIDWORKS software, Aluminum alloy, Carbon steel (AISI 1065), Gray cast iron.

EXPERIMENTAL STUDY ON THE THERMAL PERFORMANCE OF THE VORTEX TUBE WITH VARIOUS TYPES OF ORIFICE NOZZLES AND ORIFICE NUMBERS

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Abstract: The Vortex Tube is a non-conventional cooling device that will produce cold air and hot air from the source of compressed air without affecting the environment. When a high-pressure air is tangentially injected into the vortex chamber a strong vortex flow will be created which will be split into two air streams. It can be used for any type of spot cooling application. The performance of the vortex tube depends on geometrical and thermophysical parameters. An experimental investigation has been performed to realize the thorough behaviour of a vortex tube system. The nozzles material using ABS Plastic with different angles s 1°,1.5° and 2° and the vortex tube with two different lengths (100 mm and 200mm), to identify the most effective nozzle size and hot tube length, followed by the conducting of experiments to determine the energy-saving procedures that can be applied to and affect the compressed air this project design was using CAD and analysis is done by using ANSYS 15.0.
Keywords: vortex tube, ABS Plastic, CAD, ANSYS 15.0

1.0 Introduction:

The vortex tube was invented by a French physicist named Georges J. Ranque in 1931 when he was studying processes in a dust separated cyclone. It was highly unpopular during its conception because of its apparent inefficiency. The patent and idea were abandoned for several years until 1947, when a German engineer Rudolf Hilsch modified the design of the tube. Since then, many researchers have tried to find ways to optimize its efficiency. [6] Until today, there is no single theory that explains the radial temperature separation. Hundreds of papers have been published about the temperature separation in the vortex tube, with the greatest contribution being to the understanding of the Ranque–Hilsch vortex tube.

Vortex tubes:

A vortex tube is a device involving the phenomenon of separation of air currents with different temperatures that was discovered accidentally by Georges Ranque, a French physicist, while conducting an experiment. As a result, vortex tubes can produce currents of cool and hot air simultaneously through the compressed air flow in the pipe.

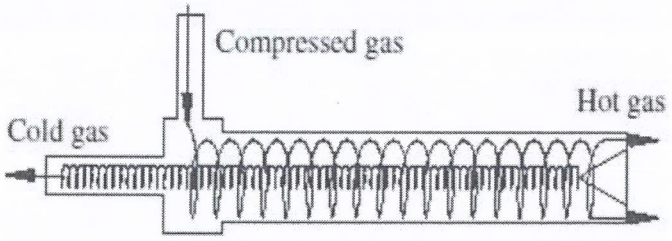

Figure:1.1 Schematic diagram of vortex tube

A source of compressed gas enters tangentially with high pressure through one or more inlet nozzles at high velocity which after expansion causes spinning vortex inside the tube. The air flows through the tube rather than pass through the central orifice located next to the nozzles because the orifice is of much smaller diameter than the tube.

FABRICATION AND EXPERIMENTAL EVALUATION OF AL - MMC AND STUDY ON ITS APPLICATION TO CYLINDRICAL PRESSURE HULL BY USING COMPUTATIONAL FLUID DYNAMICS AND FINITE ELEMENT ANALYSIS

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Abstract: *Composites are very well suited for cylindrical pressure hulls due to their low density and high strength. The development in the area of numerous types of composites brought many changes in the areas of various disciplines of engineering and revolutionized various manufacturing processes, engineering products, industrial equipment manufacturing, aerospace parts and vehicles manufacturing, material processing for various applications, defense applications, etc. Submersible vehicles these days while submerged only travel at a top speed of 65 km/h and some could attain a short speed burst of 75-84 km/h. Due to the lightweight and high strength to weight ratio of the composites, they can be used in the design of pressure hulls which are the basic building blocks of submersible vehicles so that the vehicle may travel at great speeds. The pressure hull structure must have a minimum weight for the given displacement whilst achieving a hull density as close as possible to that of the sea. This allows for a longer range or a higher payload for a given pressure hull. This paper aims at developing an Aluminium Metal Matrix Composite (Al - MMC) sample and which is tested in the laboratory for its properties and analyze the cylindrical pressure hull using the properties of the prepared composite sample using simulation studies using Finite Element Analysis (FEA) and Computational Fluid Dynamics (CFD). The Aluminium Metal Matrix Composite (Al - MMC) sample is made by using the stir casting process and is tested on UTM for evaluation of mechanical properties. These obtained properties are assigned in the simulation package and the analysis is carried out. The design of cylindrical pressure hull is carried out in Solidworks Part Design and the finite element analysis (FEA) and Computational Fluid Dynamics simulations are carried out in Solidworks Simulation and Solidworks Flow Simulation packages.*

Keywords: Al - MMC, Aluminium, Reinforcement, CFD, Composite, Design, FEA, Matrix

I. INTRODUCTION

The usage of ceramic particles as reinforcements in the formation of the aluminum metal matrix has great advantages such as low density, high stiffness and specific strength for structures. Because of these advantageous properties, the particle reinforcements have got notable attention as reinforcement material in forming MMC to use in components of aerospace, pressure hulls, automobiles, etc. [1]

In the area of aerospace and automobiles, the applications of Al - MMC are growing continuously due to their strong mechanical, tribological and physical properties [2] and are generally reinforced with particles or fibers. These Al – MMC can be manufactured by using powder metallurgical techniques and liquid metallurgical techniques such as stir casting, liquid infiltration, composting, rheocasting, etc. [3] The predominantly used technique in the preparation of MMC is stir casting due to flexibility, economic feasibility, and easiness in manufacturing and commercial availability. [4]

Since 1963 the usage of composites for pressure hulls has been increasing and shows a significant ability for their application adjacent to traditional materials such as titanium alloys and steel because of corrosive resistance and low weight to density ration nature.

In this study, Al is taken as matrix materials and SiC particles of size ranging between 30-50 μm are taken as reinforcement and four combinations called CG-I, CG-II, CG-II, and CG-IV specimens

EXPERIMENTAL STUDY ON THE THIN-WALLED STRUCTURE WITH NOVEL MULTIPLE CELLS UNDER AXIAL LOADING AND BENDING FOR CRASHWORTHINESS

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Abstract: *Thin-walled structures with multiple cells are being studied by many researchers due to their energy absorption characteristics. Thin-walled structures with multiple cells are better when coming to energy absorption than conventional single cell tubes. For the car crash, thin-walled structural tubes play a very important role in energy absorption. Circular or square profiles are the most commonly used crash structures in vehicles due to the reasons that they can be assembled easily. The thin-walled structures and tubes crashworthiness can be enhanced by reinforcing the corners by adopting multi-cell structures or by using cylindrical shells. In this study, six novel multiple cell cross-section tubes are proposed. By using welding techniques, the Thin-Walled Structure with Novel Multiple cells are made and are tested under axial loading conditions by evaluating the deformation of the thin-walled tubes for the crashworthiness. The results showed that BM2 exhibited maximum SEA 378.58kJ/kg under bending, respectively. AM2 exhibited maximum SEA of 6183.60kJ/kg under axial compression.*

Keywords: *Axial loading, Bending, Cells, Crashworthiness, Deformation, Thin-walled structures.*

1.0 INTRODUCTION

In modern society, the advanced transportation and its demand is rising on daily basis. The number of vehicles on roads is increasing continuously due to these advancements. Accidental crashes of vehicles are unavoidable and this becomes a major health concern around the globe. The vehicles' structures should convert maximum amount of kinetic energy produced during crash into another controlled and predictable form of energy for better safety. Crashworthiness is the structure capability to reduce occupants' injury and death risk through better absorbing and managing the forces of a serious crash. In aircrafts and automobiles, occupant safety design takes crashworthiness as design criterion. Thin-walled structure (TW) are the most popular collapsible energy absorbers that absorb the kinetic energy of the impact and increases structures' crashworthiness behavior. Cost effectiveness, superior dynamic loading performance, high efficiency, simplicity in
manufacturing and installation are the important aspects to use TW components as energy absorbers.

Geometry, materials, and loading mode are the prime factors that effect the TW energy absorption ability. Fibre Reinforced Composites (FRCs) and metals, such as mild steel, and aluminium alloys, are widely used as TW energy absorbers. Composites and metals have different energy absorbing and dissipating mechanisms. Due to ductile nature of metallic structures, the energy is dissipated through the progressive plastic deformation. Composite materials are generally brittle and dissipate energy through combined facture mechanisms such as matrix cracking, delamination, and fibre breakage. The energy absorption capacity per unit mass (SEA) of composites is higher compared to metallic structures. However, the design and analysis of composites re limited due to their anisotropic properties. The challenges in recycling of composites are an environmental issue. Higher manufacturing costs have limited their use in automotive and aerospace structures.

Design for vehicle crashworthiness using TW tubes has shown rapid progress in the recent years. Unconventional materials and shapes, new analysis and optimization techniques are being utilized to produce TW energy absorbers. Front rails, pillars, bumpers, and rockers are some of the vehicle structural elements and studying their interactions on the whole structure along with the crashworthy elements' behaviour helps in improving their efficiency. Front rails, as shown in Fig. 1, absorb up to 55.3% of kinetic energy of the frontal crash and is the most important structural member. Use of thin-walled energy absorber tubes as crash boxes which are fixed on the front rail is the most efficient way to increase the vehicles' elements crashworthiness.

Energy dissipation in TW tubes is due to the conversion of kinetic energy into various forms such as friction, shear, plastic deformation, fracture, torsion, metal cutting, bending, and tension. In axial loading (frontal collision) progressive deformation occurs by absorbing high energy leading to high crush efficiency. Different

DESIGN AND ANALYSIS OF THERMO-ACOUSTIC REFRIGERATOR

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ABSTRACT: In the present scenario, mostly we are using Vapour Compression Refrigerators (VCR) for preserving.But, the conventional refrigerators releases the ChloroFluoro Carbons. The release of CFCs leads to the depletion of ozone layer. So, the research on the alternatives has been going to replace the conventional refrigerators. In the Alternatives, Thermo-Acoustic Refrigerator (TAR) is one of the best device to replace existing device. In this project Thermal analysis of various types of TAR has been done toobtainthe optimum design based on temperature distribution.Heat flux and temperature distribution were obtained for various TARs proposed.

In this paper we have done CFD analysis to determine the acoustic power, temperature drop and velocity at fluids Helium inlet velocity (1007m/s) and Thermal analysis to determine the heat flux and temperature distribution for different materials (glass for tube, copper for stack different models like tube with spiral type stack, spiral type stack with blower type tube and square tube with square type stack).From the results we got, It was found that Blower type resonator tube with circular stack lead to superior cooling effects compared to other shapes of resonator tubes tested.

Keywords:*Thermo-Acoustic Refrigerator, stack, resonator tube, acoustic power, heat flux, temperature distribution*

I.INTRODUCTION

A thermo acoustic refrigerator (TAR) is a device which will be taken sound waves in order to produce the cooling effect. In a TAR, Generally the working fluid could be helium-argon mixture, and the compressor is replaced by a loudspeaker. The advantages of this kind of refrigeration cycle are two-fold. The helium and argon are inert, environmentally friendly gases, unlike many of the common refrigerants. The loudspeaker is a simple device that is more durable than a compressor and is the TAR's only moving part.

DESIGN AND ANALYSIS OF PISTON WITH VARIOUS MATERIALS USING SOLIDWORKS AND ANSYS SOFTWARE

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Abstract- A piston is a component of reciprocating engines. Its purpose is to transfer force from expanding gas in the cylinder to the crankshaft via a connecting rod. It is one of the most complex components of an automobile. This paper describes the structural analysis of three different piston materials, by using finite element method (FEM). The three different materials are, Al-GHS 1300 aluminum alloy, sic reinforced ZrB2 composite material and NASA 398 T5 aluminum alloy. The specifications used for designing the piston belongs to four stroke single cylinder engine of hero splendor plus 100cc. Modeling of various piston materials are done by using SOLIDWORKS software and finite element analysis is performed with using software ANSYS. Static structural and steady state thermal analysis is performed by using ANSYS WORKBENCH R15.0. The parameters used for the simulation are operating gas pressure, material properties of piston. The results predict the equivalent stress, total deformation and total heat flux on different piston materials using FEA. The best material is selected based on stress analysis. The analysis results are used to optimize piston geometry for better performance.

Keywords:- Piston, Finite element analysis, Ansys, Al-GHS1300, SiC reinforced ZrB2, NASA 398 T5, Solid-works.

I.INTRODUCTION

Piston is one of the mechanical components, which was invented by a German scientist Nicholas august Otto in the year 1866. Piston is considered to be one of the most important parts in a reciprocating engine, reciprocating pumps, gas compressors and pneumatic cylinders among other similar mechanisms in which it help to convert the chemical energy obtained by the combustion of fuel into useful mechanical power. It is the moving component that is contained by a cylinder and is made gas tight by piston rings. The purpose of the piston is to provide a means of conveying the expansion of gases to the crankshaft via connecting rod, the piston acts as a movable end of the combustion chamber. Piston is essentially a cylindrical plug that moves up and down in the cylinder. It is equipped with piston rings to provide a good seal between the cylinder wall.

DESIGN AND ANALYSIS OF AXIAL FLOW COMPRESSOR BLADE USING DIFFERENT MATERIAL

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Abstract- The designing of turbomachinery involves several aerodynamic parameters and along with the mechanical parameters for optimization. The cost of manufacturing these machine components is really high, as compared to automotive components. The materials used while manufacturing components also effects the performance and life of the machines. The selection of materials used in rotating and stationary components of axial flow compressor requires consideration of number of factors. This Paper is mainly focused on the designing of axial flow compressor blade by standard mean line design procedure. The effects of stress and total deformation for different materials of compressor blade is carried out by modeling and analysis using CATIA and ANSYS software tools.

Keywords – *CATIA, ANSYS, Axial flow compressor, turbo machines, blades*

I. INTRODUCTION

Axial flow compressor is a turbomachine which was used in gas turbine engines in order to deliver the required pressure and mass flow rate to the combustion chamber. The compressor rotates at very high rotational speed adding energy to the air flow at the same time increasing pressure by compressing it into the smaller volume. These are present in medium to large thrust gas turbines and airplane engines. The overall efficiency of the gas turbine engine relies on the compressor due to the fact that it delivers the required mass flow rate and pressure to the combustion chamber for the optimum combustion at the desired rotational speed.

These compressors have small frontal area as compared to centrifugal compressor. This makes the axial flow compressor more suitable for jet engines. The stage in a compressor consisting of stationary component is known as stator and the rotating component known as rotar. The rotor adds the energy to the incoming flow in the form of kinetic energy, whereas the stators decelerate the flow and converting kinetic energy into static pressure through diffusion process. The pressure rise in rotar blades is more as compared to the stator blades. The design and optimization of such blade is indeed, even a small change in the design will impact the performance of the gas turbine engines. The design of these compressor blades initially starts with the required parameters like mass flow rate, pressure rise and temperature rise. In this study, mean line design is used as a standard procedure for the compressor blade design. After completing the blade design, it is validated by using ANSYS Fluent software tool.

This paper is organized as follows: I. The introduction of the paper is provided along with structure, objectives and overall description. II. Materials and Methods. III. Design procedure and calculations are provided. IV. Discusses the design and analysis by using CATIA and ANSYS software tools. V. Results analysis is given in the table 3 Section 6. It includes Conclusion, Future Scope and References.

Design and analysis of alpha type Stirling engine

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Abstract- This article presents the design and analysis of alpha type Stirling engine aimed to run with solar energy. First, the Stirling engine was designed and its solid model was created using modeling software. Then coupled filed analysis was done on it using finite element analysis software. It is aimed to produce the mechanical power from the engine. The engine was designed to run with a renewable energy source i.e., solar energy by collecting through Fresnel lens at 400°C. A Stirling engine of about 500 watts was designed. Its components were modeled and analyzed for structural deformations and heat flux.

Keywords – Stirling engine, Design and Analysis, Hot and Cold cylinders

I. INTRODUCTION

Stirling engine is an external combustion engine invented by Robert Stirling in 1816 [1]. It is operated by cyclic compression and expansion of working fluid i.e. a gas at different temperatures. It involves a closed cycle regenerative process in which heat energy is converted into mechanical energy. The below Figure 1 shows the basic components of an alpha type Stirling engine [2].

EXPERIMENTAL TESTING OF TENSILE PROPERTIES, ILSS AND IS PROPERTIES OF ACRYLIC FIBER- REINFORCED EPOXY COMPOSITE:COMPARISON BETWEEN UNIDIRECTIONAL, BIDIRECTIONAL AND MAT FIBER FORMS

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Abstract: *Inthiswork,theexperimentalinvestigationonflexuralPropertiesandtensilepropertiesofAcrylicFiber-reinforcedepoxycompositeisdone.Thecompositeispreparedbyusingahandlayupmethodwith10,15,20%weightofAcrylicFibersintotheepoxymatrix.Fibers are oriented in unidirectional, bidirectionalandmatfiberforms.Thetensiletests,ILSStestsandIStestsonthe specimensamplesaredoneasperASTMD-638M-89andASTMD-256-97standards.Among the proposedcombinationsofreinforcementpatterns,thespecimencombinationwithID12showedexcellentimprovementinstrengthby24.04%,improvedby28.01%inelasticity,54.29%inISand64.88%inILSSpropertiescomparedtoID1.*

Keywords: *Tensile,SEM,Flexural,Acrylic,Epoxy*

1. INTRODUCTION

Composites reinforced with polymers (FRP)have good specific characteristics such asstiffness,strengthandanisotropicproperties [1]. As a result, these are widelyusedinmanyengineeringandindustrial applications such as automobile, aerospace,marine, space, electronics and many moreindustries[2].

Nowadaysthesepolymersreinforcedcomposites are being used in restructuringthe damaged concrete structures because oftheirexcellentspecificpropertiesandeasinessin using them [3].Plasticfibers,carbon fibers, and aramid fibers are beingusedasreinforcementinthepreparationof Compositeshavingpolymermatrix[4].The plastic fibers have excellent resistancetowardschemicals,highstrengthand aresuitable to use in automotive, aviation andelectronics[5].Effectivefiberorientationa nd compositions of fibers will equalize thecharacteristics of acrylic fiber - reinforcedcompositeswiththoseofmetals[6].

Omar, Andrzej Bledzki, Hans Fink, Mohinirev in theirreview paper[7] reviewed onthe most promptly used natural fibers andbiopolymersfrom2000to2010intheirpaper. The general attributes of reinforcingfibers utilized as a part of bio composites,including source, type, structure, creation,and in addition mechanical properties, arealso discussed. Moreover, the modificationtechniques; physical like corona and plasmatreatment and chemicals like silane, basic,acetylation,maleatedcoupling,andcatalyst treatment are examined. The mostmainstream matrices in bio fiber reinforcedcompositesbasedonpetrochemical andsustainable assetsare alsodiscussed.Thewide assortment of bio composite preparingprocedures and the variables like moisturecontent, fiber type and substance, couplingoperators and their influence on compositesproperties and influencing these proceduresarealsodiscussed.

COMPUTATIONAL AND EXPERIMENTAL ANALYSIS OF CORRUGATED VONKARMAN VORTEX STREET PIPE DOUBLE TUBE HEAT EXCHANGER

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Abstract *— A VonKármán pipe at the entrance of interior pipe in a double tube heat exchanger of counter flow increases its overall performance and effectiveness. The obstruction of interior pipe which is Vonkarman creates turbulence and swirling motion in the hot fluid, so that more rate of forced convection could happen. Study of forced convection was done to different interior pipes which plane, Corrugated and corrugated pipe with von Kármán Vortex street pipe at beginning. practical experiment was carried out, Analysis by means of Ansys fluent software was done. The experimental simulation helps in mimicking the process and keen thermal study can be visualized. Distribution of temperature in the corrugated Vonkarman vortex street pipe is 19.79% more than the normal pipe heat exchanger and 12.74% more than corrugated pipe heat exchanger, and heat transfer rate of corrugated Vonkarman vortex street pipe double tube heat exchanger is 26% more than the normal pipe and 19% more than corrugated pipe heat exchanger. These prove that Vonkarman Vortex street Corrugated Pipe Heat Exchanger is better.*

Keywords — Ansys Fluent, Simulation, Finite Element Methods, Heat transfer, Finite Volume Methods, Vonkarman pipe.

I. INTRODUCTION

Heat exchangers are the one of the important equipment in the industries. the working principle of heat exchangers is to decrease the temperature of hot fluids and hot gases. Heat exchangers are the equipment, double pipe heat exchanger (pipe in pipe) arrangement. There are three types of heat exchangers are generally used parallel flow, counter flow and cross flow heat exchangers. In inner tube working fluid (hot fluid) is flow.in outer tube cold water is flow in order to decrease the temperature of the hot fluid [5]. After that many researchers have done on corrugated pipes. By using corrugated pipes, the flow pattern will change laminar to turbulent flow [2]. In place of corrugated pipe twisted pipes [1] were used to create turbulence of the flow. and also continues helical twists forms the swirling motion. many researches are done this method [14] The turbulent flow depends on the geometry of the corrugated pipe. It depends on the pitch and depth of the corrugated pipe [3],[4].by using corrugated pipes we can decrease the length of the heat exchanger. corrugated pipes are the optimal design of heat exchangers [7],[12]. In corrugated pipes the condensation depends on the pith and depth of the pipe wall [6].and comparing the heat transfer effect on normal pipe and corrugated pipe, corrugated pipe shows more effectiveness and overall heat transfer rate [8],[11]. the turbulence intensity depends on the pressure drop in corrugated pipe [19]. concave, convex shape corrugated pipes are gets more efficiency, because of high pitch and depth [13]. In this paper corrugated Vonkarman vortex street pipe is used. the Vonkarman pipe is abstraction pipe which is ½ inch diameter and 2-inch length pipe. which creates more turbulence at the inner pipe? continues form of swirling motion called vortex shedding.it creates more turbulence effect than corrugated pipes. Because of more turbulence effect heat transfer rate also increases.in generally parallel flow heat exchangers were used [19].in this paper counter flow heat exchangers are used in order to increase the effect of heat transfer. The material of heat exchanger used in general steel, aluminum pipes. In this paper corrugated pvc (poly vinyl chloride) pipes are used because of pvc pipes are economical than other pipes which is used in small scale industries.

II. LITERATURE REVIEW

K.V.R Manideep et al., [1] did research and concluded better design could give desired effect and result. **Adel Asnaashari et al.,2]** investigated that turbulence plays effect on velocity and also pressure. **Ahmet Beyzade et al., [3]** said static pressure experimentally behavior changes with flows and diameter of pipe **Ti kendra Nath Verma et al., [4]** said about corrugated and non - corrugated pipes fabrication by variation in pitch

COMPUTATIONAL AND EXPERIMENTAL ANALYSIS OF CORRUGATED VONKARMAN VORTEX STREET PIPE DOUBLE TUBE HEAT EXCHANGER

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Godavari Institute of Engineering and Technology Autonomous, Rajamahendravaram, Andhra Pradesh, India.

Abstract *— A VonKármán pipe at the entrance of interior pipe in a double tube heat exchanger of counter flow increases its overall performance and effectiveness. The obstruction of interior pipe which is Vonkarman creates turbulence and swirling motion in the hot fluid, so that more rate of forced convection could happen. Study of forced convection was done to different interior pipes which plane, Corrugated and corrugated pipe with von Kármán Vortex street pipe at beginning. practical experiment was carried out, Analysis by means of Ansys fluent software was done. The experimental simulation helps in mimicking the process and keen thermal study can be visualized. Distribution of temperature in the corrugated Vonkarman vortex street pipe is 19.79% more than the normal pipe heat exchanger and 12.74% more than corrugated pipe heat exchanger, and heat transfer rate of corrugated Vonkarman vortex street pipe double tube heat exchanger is 26% more than the normal pipe and 19% more than corrugated pipe heat exchanger. These prove that Vonkarman Vortex street Corrugated Pipe Heat Exchanger is better.*

Keywords — Ansys Fluent, Simulation, Finite Element Methods, Heat transfer, Finite Volume Methods, Vonkarman pipe.

I. INTRODUCTION

Heat exchangers are the one of the important equipment in the industries. the working principle of heat exchangers is to decrease the temperature of hot fluids and hot gases. Heat exchangers are the equipment, double pipe heat exchanger (pipe in pipe) arrangement. There are three types of heat exchangers are generally used parallel flow, counter flow and cross flow heat exchangers. In inner tube working fluid (hot fluid) is flow.in outer tube cold water is flow in order to decrease the temperature of the hot fluid [5]. After that many researchers have done on corrugated pipes. By using corrugated pipes, the flow pattern will change laminar to turbulent flow [2]. In place of corrugated pipe twisted pipes [1] were used to create turbulence of the flow. and also continues helical twists forms the swirling motion. many researches are done this method [14] The turbulent flow depends on the geometry of the corrugated pipe. It depends on the pitch and depth of the corrugated pipe [3],[4].by using corrugated pipes we can decrease the length of the heat exchanger. corrugated pipes are the optimal design of heat exchangers [7],[12]. In corrugated pipes the condensation depends on the pith and depth of the pipe wall [6].and comparing the heat transfer effect on normal pipe and corrugated pipe, corrugated pipe shows more effectiveness and overall heat transfer rate [8],[11]. the turbulence intensity depends on the pressure drop in corrugated pipe [19]. concave, convex shape corrugated pipes are gets more efficiency, because of high pitch and depth [13]. In this paper corrugated Vonkarman vortex street pipe is used. the Vonkarman pipe is abstraction pipe which is ½ inch diameter and 2-inch length pipe. which creates more turbulence at the inner pipe? continues form of swirling motion called vortex shedding.it creates more turbulence effect than corrugated pipes. Because of more turbulence effect heat transfer rate also increases.in generally parallel flow heat exchangers were used [19].in this paper counter flow heat exchangers are used in order to increase the effect of heat transfer. The material of heat exchanger used in general steel, aluminum pipes. In this paper corrugated pvc (poly vinyl chloride) pipes are used because of pvc pipes are economical than other pipes which is used in small scale industries.

II. LITERATURE REVIEW

K.V.R Manideep et al., [1] did research and concluded better design could give desired effect and result. **Adel Asnaashari et al.,2]** investigated that turbulence plays effect on velocity and also pressure. **Ahmet Beyzade et al., [3]** said static pressure experimentally behavior changes with flows and diameter of pipe **Ti kendra Nath Verma et al., [4]** said about corrugated and non - corrugated pipes fabrication by variation in pitch

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Simulation of plate rolling process using finite element method

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ABSTRACT

Finite Element Method (FEM) is an efficient tool to study high-temperature elastoplastic deformation of material at roll bite in a hot rolling process. The roll bite stress field significantly changes with change in the composition of workpiece material. In this paper, a study of roll bite deformation during a plate rolling process is carried out for microalloyed grade of steel using DEFORM-3D software. Norton-Hoff flow stress constitutive equation, one of the material characteristics equations inbuilt of the software, was used for the simulations. Coefficients and exponents of the constitutive equation were evaluated using multivariable optimization technique from experimental data generated in Gleeble-3500, a dynamic thermo-mechanical simulator. Input parameters like dimensions of roll, slab and roller tables of an industrial plate mill were incorporated in the preprocessor module of DEFORM-3D software. The FEM software calculates stress, strain, roll force and temperature. The stress distribution at roll bite calculated by DEFORM-3D software for microalloyed grade of steel is compared with that of plain carbon grade of steel. Effect of temperature and coefficient of friction on roll bite stress distribution for microalloyed grade of steel is discussed in the paper. Roll force predicted by the FEM software was validated with measured roll force recorded from load cells of the industrial plate mill. The predicted roll force agrees well with the measured values of roll force.
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1. Introduction

Computer-based simulation of rolling process assists steel plants to maximize mill productivity and minimize energy consumption. Finite Element Method (FEM) based model is the most accurate method for simulation of deformation processes because it involves less simplified assumptions compared to slab method, slip-line method and upper-bound method based models. DEFORM-3D is one of the most well known commercial FEM software to solve complex elastic and plastic deformation and heat transfer problems. Niobium (Nb) is one of the most important microalloying element added in steel to obtain fine grain structure and also for precipitation of hard and stable carbide, nitride and carbonitride during rolling operation to increase the strength. In the present work, DEFORM-3D is used to simulate hot rolling of Nb-microalloying grade steel in an industrial plate mill.

In integrated steel plants, flat products are hot rolled in plate mills and hot strip mills. Hot strip mills have a series of roughing stands and a series of finishing stands whereas plate mills have one or two stands. In a multi-stand mill, the mill stiffness changes from stand to stand. Effect of variation of mill stiffness does not affect deformation behaviour in a single stand plate mill. The simulation study carried out under this work is aimed for the application of an industrial plate mill having a single stand. The layout of the mill is shown in Fig. 1. Dotted lines in the figure represent facilities to be installed in future. The mill presently has one reheating furnace for heating of slabs, a primary descaler for removal of scales from slab surface, a reversing mill stand for rolling, accelerated cooling line for thermo-mechanical processing to obtain desired mechanical properties and hot leveller, marking machine and cooling bed in down line.

Different researchers have tried FEM based simulation of the rolling process. According to Li et al. [1], the reliability of the whole simulation results is directly influenced by the accuracy of the FEM model developed. Aretz et al. [2] suggested that FEM simulation results on isotropic material may not be sufficiently accurate and

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Design and Structural Analysis of Half Shaft by using Different Materials

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Abstract: In this study, the design and analysis of half shaft are compared with different materials.The main concept of our project is to reduce the weight of automotive half shaft with the utilization of composite material. Composite materials have been played an important rolein automotive components because of their properties such as low weight, high specific stiffness, corrosion free, ability to produce complex shapes, high specific strength and high impact energy absorption etc.As the automotive half shaft is a very important component of vehicle. A shaft has to be designed to meet the stringent design requirements for automotive. In this project,We can use different materials like Steel(AISI 1053),Titanium Alloy(ti-6al-7Nb), Aluminum Alloy(al-6061) and Carbon Epoxy hybrid Composite for the half shaft.In this, half shaft is subjected to torsion. Efforts have also been carried out for modelling of the Half shaft on Catia V5 and fem based structural behaviour of different material were studied. Ansys 14.0 is used as the analysis tool in the present work to determine the total deformation, equivalent stress and the equivalent elastic strain. Also check theloads and stresses.By getting best result we can choose that material for the half shaft.

KEYWORDS: Half Shaft, Ansys, Static Analysis.

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Design and Analysisof Structural Behavior of Spur Gear for Maximum Torque of Off-Road Vehicle

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Abstract: Developing an analytical approach and modeling procedure to evaluate stress distribution under velocity and moment would provide a useful tool to improve spur gear design with high efficiency & low cost. The purpose of this work is to analyze and validate the stress distribution in spur using contemporary commercial FEM program ANSYS coupled with SOLIDWORKS modeler.

The purpose of this work is to design the spur gear set for off road terrain vehicle initial maximum torque. The modelling of the spur gear is developed in SOLIDWORKS and the analysis of spur gear is done in ANSYS 2021R1. Structural analysis has been performed on the spur gear, moment is applied on the driven gear to study the stress and deformation.

KEYWORDS: Spur Gear, FEM - Finite Element Method, ANSYS - Analysis of Systems, SOLIDWORKS.

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Heat Transfer Analysis of Plain and Corrugated Channel Using Nano Fluids

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[2,3,4,5] UG Student, Department of Mechanical Engineering, Godavari Institute of Engineering and Technology (A), Rajahmundry.

Abstract: The performance of heat exchangers especially for single phase flows can be enhanced by many augmentation techniques. One of the most popular method used is a passive heat transfer technique. Researchers have been quite active in the search of novel ways on heat transfer augmentation techniques using various types of passive techniques to increase heat transfer performances of heat exchanger. Computational Fluid Dynamics (CFD) simulations of heat transfer and friction factor analysis in a turbulent flow regime in semi-circle corrugated channels with Al2O3- water nanofluid is presented in this paper. Simulations are carried out at Reynolds number range of 10000-30000, with nanoparticle volume fractions 0-6% and constant heat flux condition. The results for corrugated channels are examined and compared to those for straight channels. Results show that the Nusselt number increased with the increase of nanoparticle volume fraction and Reynolds number. The Nusselt number was found to increase as the nanoparticle diameter decreased. Maximum Nusselt number enhancement ratio 2.07 at Reynolds number 30,000 and volume fraction 6%.

KEYWORDS: CFD - Computational Fluid Dynamics, corrugated channels, nanofluid, nanoparticle, Reynolds number, Nusselt number.

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Design and Analysis of Helical Wind Turbine Blade

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Abstract: Wind Turbine and testing its performance. Throughout the course of the study, it is proven that the turbine is much more efficient than its predecessors due to the nature of it grasping wind, and harnessing its energy. Conventional sources of power have become very expensive. Common street lights consume a lot of energy; this project aims to use the wasted energy of the wind to produce renewable energy source to produce enough power to light one or more street light. In this project we are going to design and assemble a helical wind turbine and attach it to one or more streetlights. The project will consist of a helical type turbine with an electric generator attached to it dirvia a coupling without the use of a gearbox allowing the system to be simple and applicable on a wide scale. The design of the helical blade it can be rotate continuously any direction of wind. Hence the efficiency of the turbine stress minimized. The output obtained from parameter pressure, velocity, turbulent kinetic energy.The refernce paper related comparison hybride and helical wind turbine blade.tne improve a effecincey helical blade.

KEYWORDS: Helical wind turbine, gear box, turbulent kinetic energy, helical blade



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Comparative Study on Buckling Behaviour of Polymer Composite Shells with Metallic Shells for Under Water Vessels by FEA

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Abstract: This investigation was focused on comparing the performance of polymer composite shells with metallic shells of an underwater vessel which operates at a depth of 800 m with effective length of 1000 mm and inner diameter of 250 mm using ANSYS software. For the buckling pressure of 8MPa, Hish strength steel (HY 80), Titanium alloy, Glass epoxy and Carbon epoxy materials were examined. The results showed 39.46% and 36.33% weight reduction in carbon epoxy and glass epoxy respectively when compared to high strength steel.

KEYWORDS: Underwater vessel, Critical buckling pressure, Polymer composite shells, Hydrostatic pressure, FEA, Stress stiffness matrix

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Design and Analysis of Piston Using Different Materials

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Abstract: The piston is the main part of the engine which helps in the combustion of fuel in an internal combustion engine. The piston is a casted part. The piston is to be casted extremely strong and sturdy because a little damage/failure in the casting process of this part can cause damage to the whole engine and thereby the vehicle. The piston is mostly made of cast iron and sometimes alluminium. There were some experiments going on to make the piston by using different materials to make it more efficient. In this project we design a prototype of the piston by using CATIA V5 software and analyse the properties of the material by using ANSYS software. Our main aim in this project is to design and analyse the different properties of piston made of different materials.

KEYWORDS:2D sketching,constraining,3D design

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Determination of Mechanical Properties of Al2024+SiC+Gr Hybrid Metal Matrix Composites by using Stir Casting Method

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Abstract: Aluminium alloys are extensively used in aircraft, supercars, and marine applications owing to its corrosion resistance and density.However, the Hybrid Metal Matrix Composites (HMMCs) are advanced materials, which can develop some desirable properties than the matrix material and Metal matrix composites have attracted a lot of attention in the recent years due to their excellent properties in different applications.The Present Work has been done on Al2024-Silicon Carbide-Graphite Composite.These are fabricated using Al 2024 powders as the matrix material and SiC and Gr powders are as the reinforcement materials Using Stir Casting Method.The Composites are fabricated and the obtained composites are sized into small specimens and tests like hardness test, wear test and corrosion test are conducted on the samples and the Experimental results areobtained.

KEYWORDS: Hybrid Metal Matrix Composite,Stir Casting, Composites, Al2024, SiC, Gr

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Design and Analysis of Drum Brake

N V S G Sasikiran[1] | Venkatesh B[2] | Veerabhadra Rao D[3] | Praveen Kumar Ch[4] | Sai Akhil A[5]

[1,2,3,4,5] Department of mechanical, Godavari Institute of Engineering and Technology, Rajahmundry, Andhra Pradesh.

Abstract: A drum brake is a brake that uses friction caused by a set of shoes or pads that press against a rotating drum shaped part called a drum brake. The brake drum is a critical component that experiences high temperatures and develop thermal stresses during application of brakes. In addition, the application of Shoe Pressure gives rise to mechanical loads. So the analysis takes into account both the thermal stresses and mechanical stresses together. Brakes in cars and trucks are safety parts.The energy absorbed by brakes is dissipated in the form of heat. This heat is dissipated in the surrounding atmosphere to stop the vehicle. Generally, safety parts of cars and trucks are brakes, the common material are used for drum brake is cast iron.

KEYWORDS: Brake Drum, Automobile, Mechanical Properties

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DESIGN AND ANALYSIS OF CAM SHAFT FOR MULTI CYLINDER ENGINE

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ABSTRACT:

The cam shaft and its associated motives control the hole and best of the two valves. The related components are push rods, rocker arms, valve springs and tappets. It involves a cylindrical rod running over the interval of the cylinder financial team with a quantity of rectangular lobes protruding from it, one for every valve. The cam lobes stress the valves open by way of urgent at the valve, or on some intermediate mechanism as they rotate. This shaft furthermore offers the force to the ignition device. The camshaft is driven via utilizing the crankshaft by way of timing gears cams are made as valuable additives of the camshaft and are designed in the style of method to open and almost the valves at the appropriate timing and to preserve them open for the valuable length. A normal instance is the camshaft of an auto, which takes the rotary motion of the engine and interprets it in to the reciprocating action main to hold out the consumption and exhaust valves of the cylinders. On this artwork, a camshaft is designed for multi cylinder engine and 3-D-mannequin of the camshaft is created the usage of modeling program software CREO. The modeled in CREO is imported in to ANSYS. After finishing the aspect residences, meshing and constraints the hundreds are done on camshaft for three surely one among a sort supplies mainly aluminum alloy, solid steel and cast iron to make a decision the displacement, similar pressure of the cam shaft. On this thesis, static, modal, fatigue and fracture evaluation finished in ANSYS.

Keywords: Design; Analysis; Cam Shaft; Multi Cylinder Engine.

I. INTRODUCTION

A camshaft is a rod which rotates and slides against a piece of machinery in order to turn rotational motion into linear motion. This change of motion is accomplished by the camshaft moving further and closer from the axis of rotation as the camshaft is pushed by the machinery. These moving pieces of the shaft are the cams. The linear distance moved is called the 'throw' A camshaft on an internal combustion heat engine is a device that controls both the input of fuel and the expulsion of exhaust fumes. It consists of several radial cams, each displacing intake or exhaust valves. This

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DESIGN AND ANALYSIS OF OVAL-TUBE HEAT EXCHANGER BY USING ANSYS AND COMPARING WITH CIRCULAR-TUBE

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ABSTRACT

Shell and Tube Heat exchanger are the basic types of heat exchanger one of the fluids flow through a bundle of tubes enclosed by a shell. The hot fluid is forced through the tubes to cool down by surrounding cool liquid occupied yt the shell. In order to achieve the maximum heat transfer rate an analysis is made on single tube with two different cross sections of tubes. With relate to same to have a maximum heat transfer rate this paper gives various optimal design solutions using computational techniques. To measure the performance of different designs, its model is suitably designed and fabricated so as to perform experimental tests. Thermal analysis has been carried out for different design with same fluid and on the basis of comparative results is made which one give the best heat transferrates. Here we compare the results between the circular and oval cross section tubes to qualify among two which gives better heat transfer coefficient.

Keywords: Shell and tube heat exchanger, Ansys, Temperature, Heat transfercoefficient.

I.INTRODUCTION

Heat exchanger is a universal device in many industrial applications and energy conversion systems.Various heat exchangers are designed for differentindustrial processes and applications. In heat ex-changers, shell and tube heat exchanger presentsgreat sustainability to meet requirements and giveseefficient thermal performance. Shell and tube heatexchanger (STHE) is widely used in petro-chemicalindustry, power generation, energy conservation, and manufacturing industry (Qian 2002). The bafflemember plays an important role in STHE, and itsupports tube bundle and also equally distribute thefluid in the shell side. When segmental baffles areused in STHE which have many disadvantages (Kern1950a; Li &Kottke 1998a), the low heat transfer isachieved due to the flow stagnation, i.e., dead zoneswhich are created at the corners between the baffleand the shell wall (Li &Kottke 1998b). It requireshigher pumping power, and it creates a

Design and Analysis of Precesion Steering Mechanism using FEM Method

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Abstract: In this work, the direct-indirect steering mechanism is used in which direct steering mechanism helps to rotate the wheel and an indirect steering mechanism is rotating up and down or pulls and push. Twin lever steering mechanism is push and pulls type and controlled mainly by bi-articular muscles, making use of advancements in science and technology. To perform the analysis on steering arm, we choose Ansys software to validate the design of steering arm for applied steering to from the steering wheel. In this mechanism, steering arm is directly connected to wheel hub and rotate the wheel directly. Finally, the kinematics simulation and error analysis of the avobe mentioned steering mechanism are carried out for two different materials such as structural steel and akuminum, and the results show that the steering mechanism with structural steel can meet the steering requirements of the vehicle.

Keywords: Ackerman Principle, Steering Geometry, Rack and pinion , Design, Ansys.

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Design and Analysis of Drain Scrap System for Recycling

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Abstract: Water is a critical resource in the lives of people who both benefit from its use and who are harmed by its misuse and unpredictability. There are many ways in which water intended for human consumption can get polluted. It is reported that one of the largest sources for this is untreated sewage, discharge into rivers that ultimately affects environment and thus, finally human beings.Nowadays, water is purified in many ways but here we are developing drain scrap recycler so that dumped waste in water soruces can be removed without polluting rivers and sea. So to remove a certain amount of solid waste from the waste water we will use the Drain scrap recycling machine.

KEYWORDS: Chain Drives, pulley, Drain Water, Filtration

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Design and Analysis of IC Engine Piston with Different Material

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Abstract: In today's world scenario, there is tremendous development in the field of automobile and every day, there is a new invention to do better out transport facility. Also company may concentrated on very important fact, service after sale it is consider spinal code in the field of automobile. Most of the company may spend their 50% of their income on research and development to make their vehicle better. Previously this task is very expensive in absence of recent technology, for testing and design like CAD/CAM and the analysis software like Ansys software, the prediction is very difficult about any product. Also CFD play major role for the aerodynamic designing for the automobile. Using Different CAD/CAM software one can design the product as per the requirement, and can also manufacture easily on CNC machine. This project work is based on composite materials used in automobile; there are lots of composite materials used in automobile application. In this case, we are studying the scope of different material combinations for manufacturing compositepistons.In this study two different models of composite pistons are studied under engine operating conditions with different material combinations, for model development we use Catia V5 and forAnalysis we use Ansys 15.0

Keywords: *CAD/CAM,CFD,Computer Numerical Control,Ansys,Catia,Composite Materials.*

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Design and Analysis on Engine cylinder Fins for variable Materials

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Abstract: The Engine cylinder is amechanical component, which is subjected to high temperature fluctuations and thermal stress. Fins are provided on the engine cylinder to reduce the heat inside the engine componentsand increase the heat transfer rate.fins are mainly used to cool the engine cylinder. By doing thermal analysis on the engine cylinder fins, we may know the heat dissipation inside the cylinder. The main principlein this project is to analyse the heat distribution and total heat flux by using the invisible working fluid, nothing but air under natural convection. so,manufacturingof such a large complex engine is very difficult. So, we can do model analysis. The parametric model is designed in 3D modelling software SOLIDWORKS 2020. The analysis is done using ANSYS 19.2 & SOLIDWORKS.Analysis is conducted by varying material and calculate the Temperature distribution, total heat flux and Directional heat flux. Presently Material used for manufacturing the fin body is Cast Iron. In this thesis, it is replaced by ALUMINIUM ALLOY and GRAY CAST IRON. Thermal analysis is done by using the dimensions of BAJAJ 150CC engine block.

KEYWORDS: Engine Cylinder, Heat Transfer rate, SOLIDWORKS 2020, ANSYS 19.2, Bajaj 150cc, Design & analysis, Aluminium Alloy, Gray Cast Iron.

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Design and Analysis of a Leaf Spring for Light Vehicle Mini Trucks

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Abstract: In the present scenario weight reduction is the main focus of an automobile manufacturer. Generally leaf spring is used for suspension purposes in light & heavy trucks. These springs are mainly made up of steel material which having more weight. In order to reduce the weight, here composite leaf spring is used instead of steel leaf spring.Composite materials are widely used in aeronautical, marine and automotive industries, because of their excellent mechanical properties, low density and ease of manufacture.Due to this increasing trend to utilize composite materials, it has become necessary to investigate the pros and cons of composites.Leaf springs are one of the oldest suspension components that are being still used widely in automobiles. They contribute to 15-20% unsprung weight. This work deals with the replacement of conventional steel leaf spring with composite leaf spring. Comparisonof steel and composite leaf spring usingANSYS Software. The the effects of change in design on the total deformation, equivalent elastic strain and equivalent stress was studied buy using ANSYS. The leaf spring is modeled Using CATIA for the four materials E glass epoxy, S glass epoxy, Kevlar epoxy and carbon fiber.

KEYWORDS: Leafspring, Composite materials, E glass epoxy, S glass epoxy, Kevlar epoxy, Carbon fiber.

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Design and Analysis of the Propeller Blade

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Abstract: Propellers are used for propulsion of ships and other underwater vehicles. It has a complex geometry and also analysis of such complex component under various controlling parameters is difficult with conventional formulae is very difficult and cumbersome. So the current studies uses finite element method to perform analysis of a propeller blade. This project is primarily concerned with the modelling and design study of a 3 blade INSEAN E779A model propeller blade in order to determine its strength. CATIA software is utilized to generate the blade model, which necessitates high-end modelling. Materials used for the analysis are Composite Materials instead of conventional aluminum alloy as many studies show better performance with composite material. The study gives acomparison of structural analyses of GFRP (Glass Fiber Reinforced Plastic) and CFRP (Carbon Fiber Reinforced Plastic) material and suggests the best Fiber reinforced composite material for the propeller.

KEY WORD: CATIA V5, ANSYS-WORKBENCH, CFRP, GFRP & Propeller Blade

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Design and Analysis of Hair Pin Heat Exchanger with Different Nano Fluids

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Abstract: Heat exchanger device used to transfer heat between one or more fluids. Here the fluids are separated walls of solid to prevent mixup (or) may be in direct interact. These exchangers are single tube, double tube or multi tubes with in the hair pin shell. They are base tubes, fixed tubes, and u tubes. In this project nano fluids like Titanium nitride, magnesium oxide and silver nano particles are mixed with bare fluid. i.e is water and are calculated for combination properties at different volume fractions such as 0.15%,0.25%,0.35% and 0.45% The theoretical calculations are done in determine the nano fluid properties and the properties are taken as input for analysis 3D model of the hair pin heat exchanger is done in CATIA parametric software. CFD analysis is done on the hair pin heat exchanger at different nano fluid volume fractions and thermal analysis is done hair pin heat exchanger with different materials.

KEYWORDS: convective hear transfer, hairpin heat exchanger, nano fluids, CFD analysis

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Design and Numerical Analysis of CI Engine Combustion Chamber

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Abstract: The world is facing the problem of energy so it is necessary to seek for alternative sources rather than petrol and diesel so mostly we have a choice of biodiesel in that algae oil is one of the best fuel. it has the property that to easily miscible in diesel. Algae biofuel containing very good lubrication property so it reduces the wear and tear losses in fuel injection system, cheap etc. So in this paper we are going to compare the pressure, temperature, reduction of pollutants for neat diesel with 5%algae blend,10% blend,15%blend at different cam anges using numerical analysis.

KEYWORDS: Alternative sources, biodiesel, algae, pollutants, fuel injection system

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Android Controlled Automatic Jack System for Vehicle

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Abstract: The concept of this work is to design and develop the automatic jack system using an android app. An automotive jack is a device used to raise all or part of a vehicle into the air in order to facilitate repairs. With the manually operated car jack most people are familiar with, that is still included as standard equipment with most new cars. Changing flat tire is not a very pleasant experience. Operating the manual car jack is quite difficult job. This purpose is to mainly encounter this problem. This paper presents the development of the car jack which is controlled by android app. A vehicle frame, also known as its chassis, is the supporting structure of a motor vehicle to which all the components are attached, comparable to the skeleton of an organism. Where the jack is placed in the middle of the chassis, to which the movement of the jack is control through the app. A car jack works on the 12V power supply which is obtained from the car battery itself. Operator only needs to press a button from the app without working in a bent or squatting position for a long period of time to change a tire. In order to fulfill the present car jack problem, some improvement in the present technology has to be made.

KEYWORDS: Automotivejack,jackscrew,arduinoUNO,blutoothmodule,DCmotor,Relay switch.

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Mechanical and microstructural behaviour of aluminium/TiB_2 composites fabricated through multi-pass friction stir processing

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Mechanical properties
Fractography

ABSTRACT

Friction stir processing (FSP) is a novel solid-state technique developed to refine microstructure and improve mechanical properties. FSP is the most suitable technique for fabricating the surface and bulk metal matrix composites. The aluminum metal matrix composites fabricated using the stir processing technique. The reinforcement particles of titanium diboride (TiB_2) particles were added to aluminum alloy in the solid-state. The mechanical properties of fabricated composites such as tensile and hardness were evaluated. The experimental results found that the tensile and hardness response significantly improved with an increase in the number of passes. The microstructural behavior of composites was carried out using an optical microscope and scanning electron microscopy. It is observed that the TiB_2 reinforcement particles were uniformly dispersed in the matrix material. The observed microstructures have been correlated with mechanical properties.
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1. Introduction

Aluminium Alloys are widely used in aerospace, automotive, and shipbuilding industries due to better strength to weight ratio and corrosion resistance which possess inferior wear resistance. The properties of alloys were improved by addition of reinforced particles to the matrix materials called Aluminium metal matrix composites (AMCs). Recently, application of composites has been increased because of better mechanical and wear properties [1,2]. Traditionally AMCs are produced by liquid metallurgy routes such as liquid casting, electromagnetic stir casting, squeeze casting, laser melt injection, pressure infiltration and in-situ process. It is challenging task in these methods to mix reinforcement particles in molten state of matrix material due to poor wettability of reinforcement particles [3–5]. The other issues are the reinforcement particles tend to react with the matrix material or may decompose at elevated temperatures and more chances are to form undesirable compounds which may deteriorate its mechanical properties of composites.

The friction stir welding (FSW) has been modified into friction stir processing (FSP), this process is most suitable for producing metal matrix composites (MMCs). This new production route attracts various researchers and industries for ease of manufacturing process and product reliability related to liquid casting and powder metallurgy methods. This process can be performed in the solid-state without melting the matrix material and it facilitates refinement of microstructure and improves various mechanical properties. No additional heat energy is required, and the process is considered as green technology as it generates no harmful gases, fumes and less noise while fabrication the composites. There are lesser chances of defects like porosity and air inclusions, which avoid interfacial reactions [6–9].

Several investigations were reported in the past few years about the effect of the addition of various reinforcements as whiskers and fibers such as silicon carbide, titanium carbide, aluminum oxide, silicon di oxide, boron carbide, titanium oxide, carbon Nano tubes, Fly Ash and Graphite etc. on the mechanical performance of AMCs using novel fabrication method. Among the various reinforcements, titanium diboride (TiB_2) is of much interest owing to its high hardness,better stiffness, and wear resistance [8,10–12]. Adem Kurt et al. [9] fabricated composites with silicon carbide particles as reinforcement particles onto the pure Aluminium,

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Improvements in mechanical properties of aluminium alloy-titanium di boride and boron carbide hybrid composite produced through friction stir processing route

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ABSTRACT

Aluminium alloys finds many applications in automotive, aerospace and ship building industries. Among all series AA 5083 alloys are commonly used in ship building industry but possess inferior mechanical properties which are replaced with aluminium alloy composites due to high strength to weight ratio. The present work is focussed to produce aluminium alloy composites with hybrid reinforcement Particles using friction stir processing route. The different proportions of boron carbide and titanium di boride particles are used as hybrid reinforcement particles. The aluminium alloy composites are fabricated by different proportions of reinforcement particles. The properties of fabricated composites such as ultimate tensile strength, micro Vickers hardness and impact strength are evaluated. The mechanical properties are improved and found that highest values of mechanical properties are obtained for 75% TiB_2 + 25% B_4C hybrid reinforced composite. The microstructural evaluations of composites are analysed using optical and scanning electron microscopy. It is found that hybrid reinforcement particles are uniformly distributed in the stirring zone without any micro defects.
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1. Introduction

Friction Stir Processing (FSP) is a solid state technique used for improvement of mechanical properties through plasticization of the metal and alloys in the solid state which is above recrystallization temperature but below the melting of materials. The rotating tool pin of length less than thickness of plate is plunged on to the material and traversed linearly in the material along the specified path. The tool shoulder touches on to the work material generates heat and pin plasticizes as well as mixes the material. FSP can also be used for production of composites in the solid state without melting of material. In the FSP process, the groove is made on the plate and placed the reinforcement particles and stirring is done with tool. The reinforcement particles and matrix material mixes each other and forms composite [1,2]. The various reinforcements such as CeO_2 and SiC [3], WC-Al_2O_3 [4], B_4C, TiB_2, Fly ash [5] etc. were used in processing of composites. Many researchers are done work for production of composites. Nithin Kumar et al. [6] has fabricated AA7005-B_4C-TiB_2 by friction stir processing route and it was observed that the surface hardness, wear resistance and impact strength is increased with hybrid reinforcement of B_4C and TiB_2 in the aluminium alloy. It also found an uniform distribution of reinforcement particles. The ultimate tensile strength also improved with addition of hybrid composites and achieved high hardness value of 150 Hv which has 66% more than base material. M. Nazari et al. [7] has successfully fabricated AA6061-Graphene-TiB_2 using multi pass fsp and led to uniform distribution of the particles and rearrangement of grains onto the matrix material led to tight grain boundaries and found an high hardness and wear resistance N. Yuvaraj et al. [8] has fabricated AA5083-B_4C composites and obtained better mechanical properties. The Ultimate tensile strength and wear rate was 10% more than the base alloy AA5083 with multi pass friction stir processing due to homogeneous distribution of particles and with increase of number of passes. M. Ashjari et al. [9] has fabricated AA5083-Al_2O_3 composites using submerged friction stir processing with threaded tool pin profile and observed that the number of passes reduced the agglomerations and improved mechanical properties. The Hall-Petch effect has shown strengthening mechanism for composites.

Guleria D. et al. [10] reported on bullet resistant material and studied the effect of residual velocity and young's modulus on tar-

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ENHANCED ANISOTROPIC STRUCTURAL EVALUATION OF FUSED FILAMENT FABRICATED (3D-PRINTED) SPECIMENS FOR MECHANICAL APPLICATIONS

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ABSTRACT

Polymer additive manufacturing has been commonplace in a variety of industries over the last decade. It's possible to make parts out of a variety of materials, like wear-resistant nylon, using the fused filament fabrication (FFF) process, which is one of the most technologically easy techniques of additive manufacturing. We are making different structures by using nylon material with a fused filament fabrication process (FFF). The aim of our project is to fabricate nylon structures with fused filament fabrication (FFF) process and carryout structural evaluation for determination of tensile, compression and bending strength.

Keywords: Nylon material, Fused filament fabrication process.

I.INTRODUCTION

It is a novel technology that enables rapid fabrication of physical models directly from three-dimensional computer-aided design (CAD) data without any conventional tooling or programming requirements. It offers greater design flexibility and allows companies to turn first and effective design ideas into successful prototypes and end products rapidly and efficiently. First additive manufacturing systems appeared in 1986 with the introduction of Stereolithography technology. In early 1990s, other technologies were commercialized including fused deposition modelling (FDM), laminated object manufacturing (LOM) and selective laser sintering (SLS). Stratasys introduced fused deposition modelling (FDM) technology in 1991, which has since become the most widely and commonly used AM process, which builds parts in a layer-by-layer manner by extruding semi-molten thermoplastic materials through a liquefier nozzle on to a platform. Recently, several entry level and open-source FDM type machines have appeared in the market, which can process a variety of thermoplastic materials. These low-cost AM machines not only serve as a means of learning and communications in education but also offer applications in design verification and functional testing of engineering parts. The 3D Printers are machines offering faster printability with acrylonitrile butadiene styrene (ABS) and polylactic acid (PLA) materials. Because of light weight, ease of fabrication of complex geometry and low cost, such thermoplastics parts processed by FDM have been applied at a significant pace in engineering and medical fields. Though the load-bearing parts in industry are common engineering applications of thermoplastics, the leading applications of FDM thermoplastics are in biomedical and tissue engineering fields such as novel scaffold architectures and knotless suture anchor. Thus, the knowledge of mechanical properties of FDM materials is significant now-a-days.

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FABRICATION OF COMPOSITE WALL AND STUDY OF THERMAL CONDUCTIVITY WITH DIFFERENT MATERIALS: COMPARISON OF STEADY STATE CONDITION

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Abstract

Accurate calculation of the effective thermal conductivity of different materials isgreat importance. In this present fabricated the composite wall and studied the thermal conductivity of various materials like a Gun metal, as a composite material along with Hylam, Stainless Steel withvarying the voltage at 80V, 90V and 100 at steady state condition. It was found that the results from the present study, gun metal have high thermal conductivity compared to another material.

Key words: Gun metal, StainlessSteel, Hylam ,thermal conductivity

I.INTRODUCTION

In engineering applications, we deal with many problems. Rapid growth in usage and popularity for composite material in the field of engineering and material sciences is that they provide highly attractive combination of stiffness, toughness with light weight and corrosion resistance properties.Heat transfer through the composite wall is one of them. It is the transport of energy between the two bodies or more bodies of different thermal conductivity arranged in serials or parallel. For example, a fastener joining two mediums also acts as one of the layers between these mediums. Hence, the thermal conductivity of the fastener is also very much necessary in determining the overall heat transfer through the medium. An attempt has been made to show the concept of heat transfers through composite walls. The heat energy transition from a region of higher to one of lower

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DETERMINATION AND ANALYSIS OF TENSILE STRENGTH FOR EPOXY REFINED COCONUT FIBER COMPOSITE WITH RICE HULLS AND SAWDUST AS REFINEMENTS

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ABSTRACT:

An experimental investigation has been carried out to study the effect of rice hulls at various weight percentages in the composite made with epoxy resin as matrix material and coconut fiber, rice hulls, and sawdust as fabric materials. The tensile test has been conducted on the universal testing machine to determine the tensile strength of the composite. The analysis of the composite material has been carried out using the ACP module in Ansys 2022 R1. Based on the overall study, it is observed that the tensile strength is improved for the composite containing more percentage of rice hulls.

Keywords: Coconut fiber, Epoxy resin, Ricehulls, Sawdust, Ansys 2022 R1, etc.

1.Introduction

Nowadays the solid waste problem is increasing day by day which increases the necessity for biodegradable materials the composite materials play an important role in replacing the materials which cause the solid waste problem. Natural fibers like coconut fiber, sisal fiber, etc are widely used in the fabrication of composite materials. The hand layup method is used to prepare the composite of epoxy refined coconut fiber composite with rice hulls and sawdust as refinements. Mechanical testing is conducted on the materials to determine the various properties of the material like tensile strength etc. After mechanical testing, the materials can be analyzed by using software like Ansys, etc. In ansys software, a separate module is present for the analysis of composite materials which is the ACP module in this module we can get the features of using different materials which are specified in the engineering data by entering the properties of the materials like youngs modulus, Poisson's ratio, etc. This ansys software is used to estimate the values of other materials by simply changing the materials in the engineering data this reduces the fabrication cost for the analyses of other composite materials.

2. Materials AndMethodology

The materials used for the fabrication of composite materials are classified as fabric material and matrix material. In this composite material coconut fiber, rice hulls, and sawdust are used as a fabric materials. Araldite epoxy resin is used as matrix material. The resin and hardener are used in a 10:1 ratio respectively. The hand layup method is used for the fabrication because it is easily available and low cost when compared to other fabrication methods. For the hand layup method, the mold is prepared with sheet metal in this mold some amount of resin and hardener mixture is applied as a layer on this layer a layer of coconut fiber is placed and after this again some amount of resin and hardener mixture is applied then rice hulls are poured as a layer then some amount of resin and hardener mixture is applied on it and after this sawdust is poured as a layer on it, at last, the remaining amount of resin and hardener mixture is applied on it by this the fabrication of composite material is completed. This process is repeated for the fabrication of other two specimens in which the amount of rice hulls is varied. The prepared test specimens with a volume proportion of 20-30% of fiber and 70-80% of resin, have a maximum thickness of 10mm. For each ratio three specimens are prepared by this the tensile test is carried out on these nine specimens.

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Comparative Study of TiO_2 Nanoparticles and Alcoholic Fuel Additives-Biodiesel-Diesel Blend for Combustion, Performance, and Emission Improvements

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Keywords:
tamarind oil methyl ester, dimethyl carbonate, titanium dioxide nanoparticles, engine performance, engine emissions, net heat release rate

ABSTRACT

In the current research, the engine performance, combustion, and emission parameters of biodiesel mixture 20% Tamarind oil methyl ester and 80% Diesel (B20) with the inclusion of titanium dioxide (TiO_2) in different concentrations (25.50 and 75 ppm) and 10% v/v dimethyl carbonate (DMC) as fuel additive investigated using a single-cylinder, 4-stroke, direct injection (DI), compression ignition (CI) engine. The nano fuel blends were prepared through the ultrasonication process. The ratio of 1:4 TiO_2: QPAN80 was produced higher stability and consistency out of five trials. TiO_2 were characterized using FESEM, HR-TEM, Fourier Transform Infrared (FTIR), and X-Ray diffraction. Fuel properties were determined as per the ASTM standards. Engine tests were carried out to determine the engine performance under varied loads such as 25, 50, 75, and 100% while keeping a uniform speed of 1500 rpm. The maximum reduction in BSFC, CO, HC, and NOx were found to be 17.64%, 9.49%, 7.81%, and 6.53%, and the increased BTE was observed to be 6.13% for B20T50DMC10 compared to B20 blend at full load. Thus, the combined effect of TiO_2 and DMC served excellent engine performance, combustion, and emission characteristics in CI engine operation.

1. INTRODUCTION

Extensive use of energy sources for transportation, electricity production, industrialization, and other purposes causes rapid depletion of fuel oil supplies, producing a massive demand and hiking fossil fuel prices. Along with this scenario, the significant impact on climate change has driven the research and development cells to investigate renewable fuels to seek alternative fuels to run diesel engines. Biodiesel is anticipated to be promising alternative because of its several advantages, including being renewable, environmentally friendly, outperforming on diesel engines, and producing fewer exhaust pollutants than fossil fuels [1-4]. Nevertheless, biodiesel is ideally suited for diesel engines [5]. But, the successful implementation of biodiesel usage in the various sectors was impaired due to low performance, poor atomization, higher nitrogen oxide (NOx) emissions, poor low-temperature properties, poor oxidation stability, piston ring sticking, and starting problems in cold climates [6, 7]. These shortcomings can be overcome by using different novel technologies, such as the use of oxygenated alcohols and nano additives, which may result in improved engine characteristics [8, 9].

Nanoparticle additions have many advantages such as a high surface area to volume ratio and excellent thermal conductivity, electrical, magnetic, and optical properties. As a result, these nano additives enhance fuel characteristics, stability of blends and serve as a catalyst during the oxidization process. It was also discovered to accelerate the heat transfer rate among the fuel particles and air, leading to a considerable reduction in ignition delay (ID), better combustion properties, and finally, reduced emissions (CO, UHC, CO_2, NOx) [10-12]. Conversely, the oxygenated additives show a better impact on fuel characteristics and emission reduction. The addition of oxygenated additives burns fuel effectively and reduces the ignition temperature of biodiesel which minimizes smoke emission [13].

Many researchers explored the use of nano and alcohol-based additives in biodiesel-diesel blends to enhance fuel characteristics, performance, and emissions parameters. M.A. Mujtaba et al. [5] experimented on the performance and emission parameters of diesel-biodiesel, included with nanoparticles (TiO_2 and CNT) and oxygenated alcohol (Dimethyl carbonate (DMC), and Diethyl ether (DEE)) additives on CI engine. The fuel properties of the prepared blend were found to be within the ASTMD6751 standards. The results showed that the B30+DMC ternary blend reduced maximum brake specific consumption (BSFC) by 4.1%, and the B30+DMC ternary blend improved brake thermal efficiency (BTE) by 9.88% compared to the other blends. Carbon monoxide (CO) and Hydrocarbons (HC) were reduced to 29.9% and 21.4% when correlated to the B30 sample blend. The NOx emission reduction was observed as 3.92% with the B30+CNT blend compared to B30. Razzaq et al. [14] studied the CI engine performance, and emission parameters of biodiesel-diesel (B30) blended with graphene oxide nano additives (at different dosage levels of 40,80 and 120 ppm) and 10%v/v DMC as additives. The maximum BTE was 22.80%,

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EXPERIMENTAL INVESTIGATION OF 3D FDM PRINTING BY USING PVC AND POLYCARBONATE MATERIAL TO ENHANCE MECHANICAL PROPERTIES

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ABSTRACT:

In the present situation, the term additive manufacturing (AM) is being used to produce complicated and effective components for a variety of applications. 3D printing is a common method of creating three-dimensional solid structures from a computer model. The proper selection of printing parameters is critical for producing high-quality 3D printed pieces. Fused deposition modelling (FDM) is the most widely used extrusion-based AM technique for creating 3D components layer by layer. The present work is based on FDM method to develop and analyze Polyvinyl Chloride (PVC) and clear polycarbonate parts for automotive applications. The mechanical properties of the final component are clearly affected by individual or simultaneous changes in FDM processing technique. The impact of some of the most important parameters, such as infill pattern and component selection with orientation, has been investigated in this study. There are degrees of variation in the parameters. It has been discovered that the parameters chosen have an effect on the compressive, tensile and bending power of manufactured components. To gain a better understanding of the effects of specimen form on mechanical and physical properties of 3D printed structures, a systematic testing was performed.

Keywords: FDM Technique, AM Technique,PVC, Polycarbonate materials.

I. INTRODUCTION

3D printing is any of various processes in which material is joined or solidified under computer control to create a three-dimensional object with material being added together (such as liquid molecules or powder grains being fused together), typically layer by layer. In the 1990s, 3D printing techniques were considered suitable only for the production of functional or aesthetical prototypes and a more appropriate term was rapid prototyping. Today, the precision, repeatability and material range have increased to the point that 3D printing is considered as an industrial production technology, with the name of additive manufacturing. 3D printed objects can have a very complex shape or geometry and are always produced starting from a digital 3D model or a CAD file.

The most commonly used 3D Printing process is a material extrusion technique called fused deposition modeling (FDM). Metal Powder bed fusion is gaining prominence lately during the immense applications of metal parts in the industry. In 3D Printing, a three-dimensional object is built from computer-aided design (CAD) model, usually by successively adding material layer by layer, unlike the conventional machining process, where material is removed from a stock item, or the casting and forging processes which date to antiquity.

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Evaluation of Mechanical and Micro Structural Properties of Natural Fiber Reinforced Polymer Composites

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Keywords: Mechanical properties, microstructure, natural fibre reinforced composites, filler material, tensile strength, Impact strength

Abstract. Now- a- days the polymers are frequently used in domestic and industrial purposes. The properties of polymer composites are somewhat inferior and may be improved with the addition of filler and fiber materials. Jute is one of most economical natural fibres and is obtained primarily from plant materials such as cellulose and Lignin. Sisal is a vegetable, natural, fully biodegradable fibre and which has good specific strength and stiffness and is used for making ropes and twines. The banana fibre is the strongest natural fibres and is made from the stem of the banana tree which. exhibits good tensile strength and incredibly durable and bio-degradable. An attempt is made to improve the properties of polymer composites using jute, sisal and banana fibers and addition of 2 % titanium di boride as filler material. The polymer composites were made by hand layup method with epoxy as matrix material. The mechanical properties of fabricated composites such as tensile and impact strength, hardness were evaluated as per ASTM standards. It is found that tensile strength, hardness and impact strength were improved with the addition of fibers and filler material. The micro structural evaluation is also carried out using scanning electron microscope and found that particles were dispersed in the matrix material.

1. Introduction

The polymers finds in many applications not only domestic but also in industry because of low density and cost. The polymers possess inferior properties and can be improved with addition of reinforcement Therefore, in new era trying to improve the polymer composite properties using different reinforcements. The composites consist of two parts in that major portion is called matrix material and minor portion is called reinforcement. The reinforcement may be fiber of natural or artificial and particle of micro or nano size. The natural fibres are obtained from plants such as banana (musa), jute, cotton, sisal etc. The natural fibres have good hardness, compressive strength tensile and impact strength. The behaviour of the natural plant fibre reinforced composites depends on type of fiber and its length, quantity and orientation. The another advantages are low cost , easily available ,environmentally friendly, nontoxic , high flexibility etc. when compared to the synthetic fibre reinforced polymer composites. The synthetic fibers such as glass are high cost and less degradable. Therefore the use of natural fibers plays key role in industrialization.

Many researchers investigated lot of trials on improvement of properties of polymer composites which are summarised below. Anil Kumar et.al.[1] analysed the various mechanical properties of composites. They fabricated the fiber reinforced epoxy composites using hand layup technique with a load 30 kg over the specimens by varying fibre content of 10%, 15%, 20% and 25%.The tensile properties of fabricated composites are evaluated and observed that the increasing of fibre content yields high tensile strength of 70MPa for 25% fibre content composite. The morphological observation shows that poor adhesion and higher tensile composite has a fibre pull outs for 10% fibre composite. Vishnuvardhan et.al.[2] has investigated the mechanical properties of sisal fibre reinforced epoxy composites with varying content of 15%, 20% and 25% by weight

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Experimental and Analytical Study on 2024 & 7075 Aluminium Alloy Sheets by Welded with Friction Stir Process

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ABSTRACT

This work is an attempt to study the experimental and analytical values of dissimilar 2024 & 7075 sheets of aluminium that are joined by the process of friction stir welding (FSW). The two sheets, which are aligned in perpendicular rolling directions, are welded successfully and the sheets that are welded are tested under tension at normal room temperature so as to analyze the mechanical characteristic with reference to the parent materials. The dimensions of the selected plates of AA 2024 & 7075 aluminium are 100x100x6 mm. Both the experimental and analytical analysis were carried out regarding the selected parameters such as percentage elongation, tensile strength, hardness and flexural strength. The test results indicated that the selected parameters are greatly influenced by the FSW process.

Keywords: Experimental, Analytical, Friction Stir Welding, Parameters

1.0 Introduction

The technology of friction stir welding is being extensively utilized in the modern age automotive as well as aerospace industries in order to deal with high-strength structural as well as performance demanding operations. It is a prevalent and permanent methodology of joining the thin sheets of metal and is extensively utilized in marine industry also. In this particular FSW technique (a) a non-consumable rotating tool with affiliating surfaces is utilized to produce required frictional heat that are needed for joining the metal sheets and (ii) the process of stirring by means of pin tool which plays a key role in the generation of plastically degraded zone around the pin. This particular method is deployed in order to fabricate spot welds on overlapped metal sheets and is termed to be as Friction Stir Spot Welding (FSSW). Efficient mechanical strength characteristics, less distortion possibility, low hot cracking, less residual stresses and shorter welding time enabled FSW as a superior technique when compared with conventional methods [1].This process of joining is performed in order to mitigate severe displacements or distortions and the produced residual stresses are resulted to be very less when compared with the conventional process of

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Fabrication and Mechanical Properties of Al8081, TiB_2 and Graphite by Stair Casting

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ABSTRACT

This study investigates the production of various reinforced and non-reinforced composite materials using in suit method. It presents the new approach into optimize the mechanical properties of hybrid composites (Al-gr-Tib_2) produced with stir casting process. AL 8081 powders are used as the matrix material and Tib_2 and Gr powders are used as the reinforcement materials. These extruded samples were subjected to T6 heat treatment. The composite materials produced are examined in terms of density, hardness, transverse rupture strength, and wear resistance. Furthermore, optical microscopy, scanning electron microscopy, In this study, high density Al AL 8081/ Tib_2 /gr hybrid composite materials were successfully produced. After extrusion, some micro particles were found to crack Compositions

KEYWORDS: Suit method, hybrid composites, stir casting, transverse rupture strength, optical microscopy,

1. INTRODUCTION

Composites are man made materials consisting of one or more discontinuous phases having intimate contact with each other, with are cognizable interface between them. These are multifunctional materials systems that provide characteristics not obtainable from individual phases. Further, composites are tail or made to cost effective, property effective and application oriented. In general, the discontinuous phase is harder and stronger than the continuous phase and is called the 'reinforcement'; whereas continuous phase is termed as the 'matrix'. The matrix holds reinforcement to form the desired shape and bears the major portion of an applied load, while the reinforcement improves overall mechanical properties of the matrix. Reinforcement increases the strength, stiffness, wear resistant and the temperature resistance capacity and lowers the density.

CLASSIFICATION OF COMPOSITES

In general, composites are classified according to the type of matrix material and then nature of reinforcement at two distinct levels. The first classification includes ceramic matrix composites (CMCs), organic matrix composites (OMCs) and metal matrix composites (MMCs). The term organic-matrix composite is generally assumed to include polymer Matrix composites (PMCs) and carbon matrix composites. The second classification refers to there in for cement form; particulate reinforcements, whiskers, continuous fiber, laminated composites and woven composites.

2. REALATED WORK

Depending upon the application in-service, a variety of composites with different combinations of matrix materials and reinforcements are being produced

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OPTIMIZATION OF LASER BEAM WELDING PARAMETERS FOR 90/10 CUPRONICKEL ALLOY WELDS USING TAGUCHI METHOD

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Abstract: This study is to identify the most important control elements that will result in improve the tensile strength of Laser Beam Welded Cu-Ni 90/10 alloy joints. The different laser welding process parameters and levels were used for joining of Cu-Ni alloy. The process parameters like Laser Power (LP), Shielding Gas (argon) (SG), Focal Position (FP), & Welding Speed (WS) were chosen in the experimental study. The welding was carried on 4mm thick plate as per Taguchi's experimental design. The mechanical properties were evaluated and microstructural observations were carried out. It was discovered that highest tensile strength of 234 MPa & hardness of 83 Hv were obtained which has 90 % and 87 % of the base material. The most influential optimal process parameters were determined using S/N analysis and the percentage contribution of each process parameter was estimated using ANOVA. It was found that laser power was influential parameter with a 64 % contribution in obtaining highest strength of laser welded joints. The experimental values and the results of the confirmation experiments were in good agreement.

KEYWORDS: Laser beam welding (LBM), Copper–nickel (Cu–Ni) 90/10 alloys, Tensile strength (TS), Hardness, Design matrix and Taguchi method.

1 Introduction

Typical applications for copper-nickel alloys (Cu–Ni) include ship hulls, desalination plants, heat exchanger equipment, oil rigs and platforms, seawater and hydraulic pipelines, fish farming cages, used in chemical environments, seawater intake screens etc. because of their superior corrosion resistance. Arc welding of Copper alloys, such as GTAW and GMAW, is a difficult process. The most commonly encountered challenges in welding Cu-Ni alloys have been recognised defects like cracks, porosity, undercuts [1,2]. Due to fine and uniformly distributed grains in the weld region, mechanical properties of magnesium alloy welds improved as a result of the effect of LBW process parameters LP (2.5kw), WS (5.5 m/min), and FP (21.5 mm) [3]. The Cu-Ni alloy laser welds with LP(3.5kw) and WS(1.5 m/min) showed equiaxed, fine, and uniformly distributed grains at weld zone and exhibited better mechanical properties [4]. An ideal combination of laser parameters LP(1.6 kw), beam travel speed (0.25 - 1 cm/s), FP and SG (argon), resulted in good welding of V-Cr- Ti sheets (4mm thk) [5]. Recent research was conducted on materials like Mg, Cu, Al, Ti alloys, & SS by using LBW for improvement of mechanical properties [3-10].

The Taguchi approach was used for welding dissimilar stainless-steel (AISI 316) and low carbon steel plates (AISI 1009) by optimising weld parameters like LP, WS and FP in terms to reduce the fusion zone [11]. The orthogonal arrays and utility concept of Taguchi method were used to examine the optimization of laser process parameters like LP, FP, and WS. According to the analysis of variance, the optimization of various performance characteristics were

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DETERMINATION AND ANALYSIS OF TENSILE STRENGTH FOR EPOXY REFINED JUTE FIBER COMPOSITE REINFORCED WITH SAWDUST AND RICE HULLS

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ABSTRACT:

Nowadays there is an increasing demand for natural composite material because of its high-performance applications, high strength to low weight ratio, and increased environmental issues on conventional materials that lead manufacturers to adopt the technology of natural fiber composite materials and meet consumer demands. In this work, an investigation is carried out on the properties of natural fibers. we are going to prepare composite material specimens of different weight ratios with jute fibers, rice hulls, sawdust, and epoxy resin which are biodegradable. Then we perform mechanical testing to determine the Tensile Strength of the composite material and validate these results by using finite element analysis software ANSYS 2022 R1.

Keywords: *Epoxy resin, Jute fiber, rice hulls, sawdust, weight ratio.*

I. INTRODUCTION

A composite material is a material that is produced from two or more constituent materials. These constituent materials have notably dissimilar chemical or physical properties and are merged to create a material with properties, unlike the individual elements.

Composite material is made up of three types of materials using epoxy resin. The three materials are jute fiber, rice husk, and sawdust.

1.1 Fiber material

1.1.1 Sawdust

Sawdust is obtained as a waste product from the woodworking operations such as sawing, sanding, milling, and planning are released into the air, forming a layer of dust once settled. These operations can be performed by woodworking machinery. It is a biodegradable material.

1.1.2 Rice husk

Rice hulls are the hard-protecting coverings of grains of rice. It can be used to protect rice during the growing season, rice hulls can be put to use as a building material, fertilizer, or insulation material, it can be easily collected and is cheap, some amount of rice husk has always been used as an energy source for small applications, such as for brick production, for steam engines and gasifiers used to power rice mills, and for generating heat for rice dryers.

1.1.3 Jute fiber

It is a natural fiber with a golden and silky shine. Jute is extracted from the bark of the white jute plant. The fibers are off-white to brown, and 1–4 meters (3–13 feet) long

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COMPARATIVE STUDIES AND MECHANICAL PROPERTIES ON DIFFERENT VOLUME FRACTION OF PINEAPPLE LEAF FIBER AND JUTE FIBER REINFORCED EPOXY RESIN COMPOSITES

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Abstract

Fiber reinforced composites have been around since the dawn of civilization. Natural fibers such as banana fiber, glass fiber, jute fiber, palffiber, sisal fiber, and baggasfiber are utilised as reinforcements for composite materials at random because of their different advantages over conventional fibres such as low cost, low density, and low energy consumption. They are both recyclable and biodegradable. A hybrid fibre composite (palf fibre and jute fibre) was developed in this study. They were made by hand using the lay-up method. The epoxy resin that was employed to make the hybrid composite. PALF is crystallised and has high cellulose content (between 70 and 80 %). To improve its mechanical and thermal characteristics, PALF is composited with jute fibre. The ultimate tensile strength, flexural strength, hardness, and percent of elongation of specimen samples all were tested. The experiment results showed that hybrid fibre reinforced epoxy composites outperform single fiber glass fiber reinforced in terms of characteristics.

Keywords: Palffiber, Jute fiber, Mechanical properties

I.INTRODUCTION

Natural fibers are abundant, biodegradable, and offer no health risk to humans or animals. Furthermore, natural fiber-reinforced fibers are thought to have a promising future as an alternative to petroleum and fossil-based fibers. Natural fibres are taken from various components of plants and then categorised. It's worth noting that natural fibers like jute, coir, banana, and sisal are abundant in developing countries like Vietnam, Thailand, and India.

Natural fibers have become more popular in composite manufacturing than any other type of material. Natural fibers have already replaced synthetic fibers in a variety of applications, including boat hulls, packaging, automotive, civil constructions, chemical equipment and machinery constructions, bathtubs, electrical and electronic equipment, automobile and marine industries, car manufacturing, aircraft manufacturing, military, industrial, and biomedical sectors, archery bows, and so on. Because natural fibers are durable, has good thermal qualities, is low in density, and is inexpensive, recyclable, biodegradable, and environmentally safe. Fibers are progressively being used in research projects. Plant fibers are employed on a variety of plastic substrates. **Arib et al., (2006)** proposed that fiber content should be increased. With a volume percentage of 10.8%, the tensile modulus and strength are 687.02 and 37.28 MPa, respectively. **Rahman et al., (2008)** investigated mechanical parameters and observed that 60 % jute content generated the best tensile strength (70 MPa), bending stress (75 MPa), and bending-E-modulus (2.35 GPa), whereas 38 % jute content produced the highest Young's modulus (1.95 GPa).According to **Vivek Mishra et al., (2012),** these properties improved when the void content was lowered from 12 wt. % to 48 wt. % and the fibre loading was reduced from 0 wt. % to 12 wt.%.Flexural tests were performed by **Santosh Kumar et al., (2012)** on specimens with volume ratios of 10%, 20%, and 30%. The results of the test revealed that when the volume ratio improved from 10% to 30%, the flexural strength increased substantially. At 30%, the maximum value of flexural strength was attained.**J.K. Odusoteet al., (2016),** high concentrations of NaOH improved the crystallinity and size of the PALF crystallite while also increasing the mechanical strength and stiffness of the fibre up to a point after which the fiber strength and stiffness steadily declined. **Glória et al., (2017)** despite

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Effect of Cylinder Block Fin Geometry and Material on Heat Transfer Rate of Air Cooled 4-Stroke SI-Engine

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ABSTRACT

The objective of this project is to increase the heat transfer rate of a 4-stroke air cooled Spark ignition engine in order to reduce the losses (friction losses, uneven expansion of piston and cylinder, burning of lubrication oil) associated with heat produced during combustion stroke in engine cylinder. The heat transfer rate of fins is mainly depending on three parameters, one is fin geometry and surface area of fin and material used to manufacture the fins. In order to increase engine efficiency, different fin geometries like circular, rectangular wavy and curved shapes are designed and different types of fin materials like aluminum alloy and copper-alloy are used to increase the heat flux and to increase the efficiency of engine. In this project numerical simulation of the engine cylinder with different fin geometries and fin materials are going to present to improve the heat dissipation rate of an engine. The modelling of fins carried by using SOLID WORKS whereas ANSYS will be used to conduct steady-state thermal analysis. The optimized design of fin geometry and fin material for the engine cylinder willbe stated based on the results obtained from the analysis.

KEYWORDS: Fins, SI engine, Engine losses, Thermal analysis

1. INTRODUCTION

The main power source to run an automobile is engine in which the chemical energy of fuel is converted into thermal energy and again thermal energy is converted into mechanical energy. In automobiles Internal combustion engines are used to produce power. The working of internal combustion engine mainly involves 4-strokes namely suction stroke, compression stroke, expansion stroke and exhaust stroke. During the suction stroke the charge (mixture of fuel and air from carburetor) is entered into the engine cylinder and at the end of compression stroke the combustion of fuel takes place and the high temperature and high-pressure combustible products expands in the expansion stoke or working stroke and the exhaust gases produced in engine cylinder due to combustion are exhausted from the engine cylinder in exhaust stroke. Generally, the temperature produced during combustion stroke of a spark ignition engines are approximately about 500-550 degrees centigrade in order to reduce these high temperatures there are few methods are employed in internal combustion engines. In order to provide cooling system for automobile engines there are few methods are employed like direct cooling system (also known as dry cooling system) and indirect cooling system (also known as wet cooling system) and lubrication system is also acting as cooling system. Providing cooling system to spark ignition engine plays a significant role in reducing

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Finite Element Analysis of Piston Using Thermal Barrier Coating

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The piston is responsible for transmitting gas pressure exerted by combustion gases into reciprocating motion and is responsible for kinetic energy. During this process, the piston crown is continuously subjected to various thermal and structural loads such as gas pressure load, side thrust, and connecting rod load, inertia load. This will result in piston seizing by overheating, and cracks on top land ultimately affecting engine efficiency. To reduce heat absorption and increase insulating property Thermal barrier coating is applied on top land. The modeling of the piston is made on Solid works. In this project, the Analysis is performed on a piston made of aluminum alloy with and without thermal barrier coating materials (Magnesium zirconate, Lanthanum doped zirconate, Yttria stabilized zirconia). Structural analysis, Steady-state thermal analysis is carried out on the piston in ANSYS and aims to study its behavior by comparing it with the conventional piston.

Keywords: Thermal Barrier Coating, Structural Analysis, Steady State Thermal Analysis

1. INTRODUCTION

In an internal combustion engine piston is the reciprocating part that transmits force generated by combustion of air fuel mixture. It occurs by pushing the piston through great amount force which is produced by expansion of combustion gases. In a conventional IC engine air -fuel mixture of proportioned quantity enters in the cylinder when piston moving towards bottom dead center and intake takes place. At the time of compression stage air-fuel mixture is compressed to high limits of temperature and pressure, at the end of stroke charge ignites and combustion of charge results in expansion of combustion gases which pushes the piston down at great speed and piston transmits this energy to piston pin, connecting rod, crank shaft. Due to this impact various thermal forces, Inertia force, combustion gas pressure, connecting rod load and side thrust, acts on piston, and most of them acts on top land or crown of piston.

Throughout this process most of the heat produced is absorbed by the piston. To prevent piston from failing, cracks on crown, piston seizure due to overheating, a thermal barrier coating on piston surface is utilized. Thermal barrier coating acts as insulator which acts as barrier for heat to transmit into piston. The materials used for coating have low thermal conducting property and high coefficient of thermal expansion, Retain its structure and phase at elevated temperature. The study indicates that 30% of heat is carried away by engine cooling system and good solution may be engine thermal barrier coating. Thermal barrier coating owing their insulating properties which helps in increasing the fuel

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Static & Modal Analysis of Lathe Spindle using ANSYS

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ABSTRACT

The machine tool spindle provides the relative motion between the cutting tool and the workpiece which is necessary to perform a material removal operation. The present machine tool structures consist of spindle system which plays a vital role in the quality of the final product and enhances the overall productivity and efficiency of the machine tool itself. During its operationthe spindle undergoes many vibrations due to various factors like bearing defects, incorrect bearing alignment, out-of-balance assembly, incorrect lubrication and high critical speeds. The major force acted on spindle is due to cutting force. The distance between the bearing supports of spindle plays an important role in reduction of deformation in spindle. It is very important to analyze the vibration effect on a spindle to avoid the damage occur due to resonance. Herestatic structural analysis is carried out on spindle to decide the better span and then modal analysis is done using the ANSYS software.

KEYWORDS: Lathe spindle, static analysis, modal analysis, ANSYS, bearing span, resonance, cutting force.

1. INTRODUCTION

In machine tools, a spindle is a rotating element of the machine,which is responsible for the rotations of chuck(workpiece holder) to carry out various operations, which often has a shaft at its heart. In shop-floor the word spindle is used metonymically to refer to the entire rotating unit, including the shaft itself, its bearings and any other items attached to it (chuck). On the other hand, a machine tool may have several spindles, like the headstock and tailstock spindles on a bench lathe. Among the several ones,the biggest one is the main spindle. In industrial areas, the specialized tasks require the specialized machine tools in order to satisfy the high-volume mass production. These tools may have a group of 4, 6, or even more main spindles. These tools are called multispindle machines. For instance, gang drills and many screw machines etc, can be considered as multispindle machines. On the other hand, even a bench lathe possesses more than one spindle (including the tailstock), it is not a multispindle machine, because it has only one main spindle.

Examples of spindles include

- On a lathe (whether wood lathe or metal lathe), the spindle is the main component of the headstock.
- In the machinery of rotating-cutter woodworking,shaped milling cutters are seated on the spindle for cutting features (such as rebates, beads, and curves) into moldings and similar millwork.
- Similarly, in the machine tools for rotating-cutter metalworking (such as the drill presses and milling machines), the tool is fixed to mounted on the spindle (example, via a chuck).

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Modelling and Analysis of Centrifugal Impeller Using Composite Materials

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ABSTRACT

Centrifugal pump is a machine that imparts energy to a fluid. This energy can cause a liquid to flow or rise to ahigherlevel.Centrifugal pump is an extremely simple machine which consists of two basic parts: The rotary element or impeller and the stationary element or casing. A centrifugal pump is a rotational dynamic pump that uses a rotating impeller to increase the pressure of a fluid. An impeller is a rotating component of a centrifugal pump, usually made of iron, steel, bronze, brass, Aluminumorplastic,whichtransfersenergyfromthemototthatdrivesthepumptothefluidbeingpumpedbyaccelerating the fluidoutwardsfromthecentreofrotation.Asignificantimprovementisrequiredforimpellerdesigntoresistcorrosion,erosion & lessweight.The aim of the project is to increase the life of the centrifugal impeller using composite materials. SOLIDWORKS software is usedfordesigningthecentrifugalimpellerANSYSsoftwareinusedforperformingthestaticandmodalanalysisusingcomposite materials (Carbon Fiber Reinforced Polymer, Glass Epoxy, Kevlar Epoxy). Finally, the effectiveness of suitable material for impeller is evaluated based on the stresses, strains, Total deformations in static structural analysis and total deformations at different frequencies in modalanalysis.

KEYWORDS: Centrifugal impeller, composite material, carbon Fiber Reinforced polymer, Glass Epoxy, Kevlar Epoxy.

1. INTRODUCTION

Centrifugal pump is a hydraulic machine which converts mechanical energy into hydraulic energy and are used extensively in a wide range of residential and industrial applications. Centrifugal pumps are used to transport fluids by converting rotational kinetic energy into hydrodynamic energy of the fluid flow. This rotational energy comes from an electric motor or engine. The fluid entersthepumpimpelleralongorneartotherotating axis and is accelerated by the impeller, flowing radially outward into a diffuser or volute

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Design and Fabrication of V4 Solenoid Engine

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ABSTRACT

In the present automobile industry Engine is the main source of energy and majority of these engines are internal combustion engines (I.C engines). Which uses fossil fuels like petrol, diesel, and CNG as the main fuel source. These fuels are combusted in an engine which releases heat energy which in-turn converts mechanical energy. The combustion of these releses harmful gases into the atmosphere which causes pollution and all well as adverse effects on the living beings. As the fossil fuels are non-renewable energy resources and we can have exhausted in the near future, currently electric cars are the best alternatives for a conventional I.C engines. Electricity is the souce of energy with almost zero emission of pollutants. The objective of project is to design and fabricate a V4 solenoid engine which uses principle of electromagnetism to convert electrical energy in to mechanical energy and thus power the vehicle.

KEYWORDS: Engine, I.C Engine, fossil fuels, solenoid engine and electromagnetism

1. INTRODUCTION

An engine is a machine that converts a source of energy into a physical work. Engine can be used if we need something to be moved around. We have multiple types of Engines not all of them are made same and have different working principles. The best way to differentiate between engines is by type of energy and for the use of power [1]

The Engines can be classified in to following types, they are:

- Thermal Engines
  1. I.C Engines 2. E.C Engines
- Electrical Engine

Electrical Engine:

An Electrical Engine is a machine which converts electrical energy into mechanical energy. The electric Motor is run by the magnetic field, where the electric current in a wire winding generate force in the form of torque applied on the motor shaft. The electrical engines can be run through D.C sources i.e. batteries or by A.C sources such as power grid

Solenoid:

Solenoid is an Electromagnet which producea a Controlled Eletric field. The purpose of the solenoid is to generate magnetic field. A solenoid is a cylindrical shaped conductive wire wound in the shape of a helical, when electricity passes through the solenoid it produces Electro magenetic field due to the principle of e.m.f. The Term solenoid was introduced in 1823 by Andre-Marie Ampere.

Solenoid provide magnetic focusing of television camera tubes such as vidicons and also electrons in vaccum. The solenoids surround nearly the whole length of the tube [2]

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Design & Fabrication of Monolithic Complaint Peaucelliar Mechanism

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ABSTRACT

Monolithic compliant mechanism allows the transmission of force and motion viathe elastic deformation of the links and the change in the shape of the links temporarily when the load is applied. It is used in large areas where the applications of precision like the endoscopic tools which are being used in the medical treatments, sports, handicapped persons for running in marathons, large vehicles for abosorbing the shock waves etc. The intention of the project is to design and analysis of Peaucelliar mechanism for the straight line motion applications. The analysis of the mechanism is done by the Finite Element Analysis where the design is done through the Solid works to determine the straight line displacement and its stresses.

KEYWORDS: Complaint mechanism, force, motion, precession, endoscopic tools.

1. INTRODUCTION

The mechanisms when they give a straight line as output of the mechanism when the input of the mechanism is either the rotational motion or oscillating motions are known as straight line mechanism. The straight line mechanism is extremely helpful in the places like machinery design and manufacturing process to make a rectilinear motion, as the technology increases the usage of mechanism is also increases in the robotics field, therefore the straight line mechanism is also used in the roboticsfield [1]. Hart mechanism, Scott-Russel mechanism, Grasshopper mechanism, watt mechanism, Tchebicheff mechanism, kempe's mechanism, parallel linkages, Peaucelliar mechanism are all known as straight line mechanisms [2].

The Peaucelliar mechanism also known as Peaucelliar – Lipkin mechanism was first mechanism which was able to make a transformation from rotary motion to the linear motion and it is also the first true planar mechanism which was invented in 1864 and it was named after Charles-Nicolas Peaucelliar. At first this mechanism did not gain that much name until 1871. It was demonstrated independently by the Lipman Lipkin a Chevyshev pupil at the University of St. Petersburg [3]. The Peaucelliar mechanism generates the straight line and works on the principle of inversion. This principle is about the change in rotary motion to linear motion with geometrical constraints [4,5].

Complaint mechanisms are growing widely and rapidly in the modern world. The complaint mechanisms are joint less mechanism which makes them to look like a single entity. Complaint mechanism works by absorbing the strain energy and partial deformation of a body and gives the required motion. It transforms back to normal shape when the strain is released from the body. There are no linkages or joints between the links, because of

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Fabrication and Analysis of Mechanical Properties of Aluminum MMC Produced by Stir Casting

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ABSTRACT

Aluminum alloys are popular materials in industrial applications because of their higher specific strength to weight ratio and excellent mechanical properties. These alloys are combined with other material to form composites. A composite material is a combination of two phases called matrix and reinforcement with different physical and chemical properties. When they are combined they create a material which is specialized to do a certain job, for instance to become stronger, lighter or resistant to electricity, etc. The need for superior execution and minimal expense materials caused scientists globally to change their concentration from solid to composite materials due to their better mechanical properties.

Many manufacturing processes are offered for the fabrication of aluminum metal matrix composites. Stir casting is recognized as a predominantly capable process, and its advantages turn over in its effortlessness and flexibility to a massive manufacturing.

This project proposes the fabrication of Aluminum Metal Matrix Composites (AMMCs) using stir casting technique by varying the amount of hybrid reinforcement particles. The mechanical properties such as tensile strength, impact strength, wear, hardness will be evaluated. Al6082-T6 is taken as the metal matrix phase, titanium diboride (TiB2) and graphite powder are taken as the reinforcement phase.

KEYWORDS – Stir Casting, Aluminum Metal Matrix Composites, TiB2, Graphite, Tensile Strength, Impact Strength, Wear, Hardness, Hybrid reinforcement

1. INTRODUCTION

Aluminum Alloys are one of the most widely used materials in industrial applications like automotive, aerospace and ship building due to their high strength to weight ratio and better mechanical properties [1]. Aluminum metal matrix composites (AMMCs) are widely replacing the conventional aluminum alloys in many applications due to their superior mechanical properties and tribological properties [2] [3]. A composite is a material made of two constituent phases namely a reinforcement phase and a matrix phase. Although these two phases are not soluble they can be macroscopically combined. A lot of research has been conducted to improve the properties of AMMCs by using various methods and different reinforcements like Al2O3, B4C, TiC, Fly Ash, TiB2, Graphite, SiO2 etc. [4] [5].

Hybrid Metal Matrix Composites (HMMCs) are one of the recently developed advance materials having better mechanical. Hybrid reinforcement is a combination of different reinforcements [9]. The Aluminum metal matrix composites are produced by liquid metallurgy techniques like conventional stir casting and electromagnetic stir casting [5] [6], squeeze casting [7], pressure infiltration [8]. The liquid metallurgy

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Design and Fabrication of an Inverted Pendulum Control System

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The inverted pendulum is a classical control problem, which involves developing a system to balance an inverted pendulum. For visualization purposes, this is similar to trying to balance a broomstick on a finger. This system incorporated a full system design including all of the mechanical, electronics, and aspect to the control system. There are three main subsystems that compose this design: The first is mechanical system, second is the feedback network which includes sensors and a method to read them, and final one is a controller which an interface to the mechanical system. After determining sets of requirements between the subsystems, each one was designed independent of the other two, simplifying the design process.The mechanical design involves building a fabriacted cart, pendulum, and drive mechanism. The cart and pendulum were developed out of primarily aluminum. The drive mechanism is a DC motor with bearings mounted onto its shaft to pull a cart, which the cart connects to it. The feedback network consisted of encoder, which were sampled by an analog-to-digital converter, to measure the angle of the pendulum and the displacement of the cart. The final system results in a cart that could balance a pendulum for a limited amount of time.

KEYWORDS: Inverted Pendulum, feedback network, Encoder

1. INTRODUCTION

The inverted pendulum (IP) control system design has become a common engineering challenge for researchers due to its important applications in practical life [1]. The problem is analogus to controlling a broomstick in the palm; most of the children do that in childhood aiming to make the stick stable in the vertical position. The IP stability and control has been a subject of research that attracts the attention of engineers and researchers since the last 50 years. IP model is used widely nowadays inrockets launching and missiles guidance.

An inverted pendulum is a pendulum which has its centre of mass above its pivot point. It is often implemented with the pivot point mounted on a cart that can move horizontally and may be called a cart and pole. Most applications limit the pendulum to 1 degree of freedom by affixing the pole to an axis of rotation. Whereas a normal pendulum is stable when hanging downwards, an inverted pendulum is inherently unstable, and must be actively balanced in order to remain upright; this can be done either by applying a torque at the pivot point, by moving the pivot point horizontally as part of a feedback system, changing the rate of rotation of a mass mounted on the pendulum on an axis parallel to the pivot axis and thereby generating a net torque on the pendulum, or by oscillating the pivot point vertically.

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Performance Analysis of Ramjet Engine Combustion Chamber

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ABSTRACT

Today's aircraft are powered by a variety of engines that generate thrust depending on the application. Each aircraft has a different type of engine depending on its intended use. One of the most important sources of supersonic flight power is the ramjet. In the near future, missiles powered by Ramjets will lead the aviation market. Ramjet combustion has a variety of issues, including combustion instability and enhanced fuel mixing. Compressed air and pressurised fuel both are mixed and burned in the combustion chamber. The gases which are produced inside the combustion chamber will create thrust at the exit of divergent nozzle. Thus ramjet will move in forward direction. In this project air and fuel are burned in a combustion chamber in a small scale of ramjet engine. The performance analysis of ramjet engine combustion chamber will be analyzed.

KEYWORDS: Ramjet, Combustion chamber, Convergent nozzle, Air-Fuel supply system.

1. INTRODUCTION

Today's aircraft are powered by a variety of engines that generates thrust depending on the application. Each aircraft jet engine has its own collection of benefits and drawbacks. Each aircraft has a different type of engine depending on its intended use. One of the most important sources of supersonic flight power is the ramjet. The Ramjet and the Supersonic Combustion Ramjet (Scramjet) Engine Cycle an invention attributed to Rene Lorin of France in 1913 (Hallion, 1995), the ramjet is remarkable air-breathing engine in its conceptual simplicity.

Generally the ramjet engines works with the help of Air and Fuel mixture. Ramjet engine is an air-breathing engine it takes Atmospheric air as a air supply system. The Fuel used in ramjet engines are Liquid Hydrogen. The air entering to ramjet engine with super sonic speed is slowdown to sonic velocity in the supersonic diffuser, increasing air pressure the air pressure is further increased in the subsonic diffuser increasing also the temperature of air. The outlet pressure of the air at the exit of the diffuser is increased when compared to inlet of diffuser(P2>P1). The diffuser section is designed to get correct ram effect its job is to decrease the velocity and increases pressure of incoming air. The Fuel is stored in a closed container with a calculated value, a common pipe which connected to the mixing chamber which is having both Air and Fuel. In the mixing chamber both air and fuel is well mixed and then passed to the combustion chamber. In the combustion chamber the air-fuel mixture which comes from the mixing chamber is get ignited with the help of spark. Due to the combustion the air and fuel burned in the combustion chamber and it is gaseous form. These gases having high temperature, high pressure, low velocity. The gases are comes out from the combustion chamber and goes into the convergent

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Design and Thermal Analysis of Condenser in Air Conditioning System Using FEA

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Condensersare used in air conditioning systems to extract undesired heat from the refrigerant and send it to the outdoors. The condenser coil is the principal component of a condenser, through which the refrigerant flows, and fins are the extended surface of the hose pipe that aids in heat transmission to the atmosphere. Heat rejection from the condenser is dependent on a number of factors, including the surface area of the fins and tube, the material used in its manufacture, the length of the hose pipe, the refrigerant used in it, and so on. It is therefore critical to choose the right material for the condenser and modify the fins to improve the air conditioner's performance. The project's goal is to optimise design parameters.

KEYWORDS: Condenser,SOLIDWORKS,ANSYS,c17500,Al2014,MgAZ31B

1. INTRODUCTION

An air conditioner is a household equipment that dehumidifies and removes heat from a space. In a closed cycle known as the refrigeration cycle or heat pump cycle, all air conditioners use the same compression, condensation, expansion, and evaporation cycle. The heat is moved from a hotter to a cooler location using the same refrigerant. The first phase in the refrigeration cycle is compression, and a compressor is the piece of equipment that raises the working gas's pressure. Low-pressure, low-temperature refrigerant enters the compressor as a low-pressure, low-temperature gas and exits into condenser as a high-pressure, high-temperature gas.Among the two, one of the two types of heat exchangers used in a basic refrigeration loop is the condenser, or condenser coil. The condenser removes heat from the hot refrigerant gas vapour until it condenses into a saturated liquid condition, which is referred to as condensation. The refrigerant condenses into a high-pressure, low-temperature liquid, which is then transported to the expansion device in the loop. The expansion device in a system does the same thing: it drops the pressure when the refrigerant leaves the condenser. Because of the pressure reduction, some of the refrigerant will boil quickly, resulting in a two-phase mixture. This rapid phase change is known as flashing, and it helps the evaporator, the next phase of process in the cycle, fulfil its role. The evaporator, like the condenser, is the second heat exchanger in a conventional refrigeration circuit and is named after its primary purpose. Given that it performs what we anticipate air conditioning to do - absorb heat - it acts as the end of a refrigeration cycle. When refrigerant enters the evaporator as a low-temperature liquid at low pressure and a fan drives air through the evaporator's fins, the air is cooled by the refrigerant absorbing heat from the place.

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Design and Analysis of Single Plate Clutch for a Four Wheeler using Various Materials

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ABSTRACT

The clutch is one of the major components which can be seen in automobile. The clutch is used to transfer the maximum torque from the engine to the propulsionsystem. If a problem occurred in that crucial component it will halt the total system which occurs mostly because of deformations and strain .So a clutch plate has to be designed which has to be more heat resistant ,and results in less deformations and strain .The maximum structural stress technique should be implemented in design of clutches for increasing their durability and compactness .This project explains the static structural analysis and modal analysis of the single plate clutch and applying various types of materials .This project is used to find the stresses and deformations in failure region during the working of clutch and suggest the material changes to increase the life span of the clutch.

KEYWORDS: ANSYS,CATIA_V5,Friction_ Materials,SA92,SFMC2,30cr13,Tata Sumo gold

1. INTRODUCTION

Clutch is the mechanical component of generating power which is used on the transmission shafts. The main aim of a clutch is to engage and disengage the engine to the transmitting power whenever the user needs changing of gears. During the connecting position of clutch the power is passed from the engine to wheel and the power is not transmitted to wheel from the engine when it is disconnected. A Gearbox is placed in an automobile and is used in changing of the torque and speed of the four-wheelervehicle. If a gear is changed when the gearbox is engaged with the engine of the vehicle it can leads to wear and tear of the gear during its running position so to avoid this type of challenges clutch is introduced and are placed between the engine of the vehicle and gear box. Friction plates which are commonly known as clutch plates are placed in between the two units .The friction plays the huge role during the working of the clutch. If two surfaces containing friction comes in contact with each other and applied pressure then they became into a unit because of frictional forces acting in them . The area of surface, applied pressure and the acting frictional forces in them impact the friction between them. The flywheel which is placed on the engine crankshaft is the driving unit and the pressure plate placed on the driving shaft is the driven unit.

The clutch is commonly grouped into two types and they are Positive clutch and the Friction clutch. The clutches which are used during the requirement of a positive drive is said as the positive clutch. The jaw or claw clutch which is commonly used as the positive clutch and is called as the simplest type of clutch. The application of the friction clutch is seen in the transmitting of power to the shafts which are frequently start and frequently stall.

2.RELEATED WORK:

OBJECTIVE:

To analyze the performance of single plate clutch using different materials which is designed in Catia v5 and transferred to Ansys for static structural

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Performance Analysis of Domestic Refrigerator Using R600a by Varying L/D Ratio of Capillary Tube

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ABSTRACT

A Domestic Refrigerator is an electrical appliance which is used to store the items for longer period of time to avoid spoiling items.In this research the evaluation of performance of R600a is refrigerant grade Iso-Butane used as a replacement for R12 and R134a in a variety of high temperature refrigeration applications and low global warming potential. Vapour compression system was investigated and the experiment have been conducted by varying L/D ratio of capillary tube in order to achieve best coefficient of performance. The research also have been analyzed how the various important parameters varies with respect to L/D ratio such as, refrigeration effect, power required to run the compressor, mass flow, specific volume, variation of suction and discharge pressures. In order to find optimal value COP, C-Programming has been used to find optimal value of COP for various L/D ratios.

KEYWORDS:R600a, coefficient of performance, capillary tubes, suction pressure gauge, discharge pressure gauge.

1. INTRODUCTION

Refrigeration is one of the methods to lowering the temperature in order to produce cooling effect to an object by removing unwanted heat in it[1]. They are different types of refrigeration systems are used some of them are Mechanical Compression Refrigeration System , Evaporative Cooling system , Thermoelectric Refrigeration and Absorption Refrigeration systems . In this project we are focusing on vapour-compression refrigeration system. The vapour compression refrigeration cycle involves four processes namely compression, condensation, expansion and evaporation[5]. In compression process the vapour refrigerant is compressed in a compressor to a high pressure due to the compression temperature of the vapour refrigerant is also increased after that this high temperature and high pressure vapour refrigerant is entered into the condenser in condensation process in which high temperature vapoursloses its heat to the circulating cooling water of condenser and phase change takes place from vapour to liquid .And then low temperature and high pressure liquid refrigerant enters into the expansion valve and further gets cooled and finally this chilled low pressure liquid refrigerant enters into evaporator where the cooling effect takes place due the absorption of heat from the object or conditioned space and due to this heat exchange the refrigerant gets heated and phase change also takes place . In this project we are using R600a refrigerant. Generally,R12 refrigerant is used but due to R12 refrigerant releases Cfc's which causes the depletion of ozone layer to overcame these disadvantages we are using R600a[3]. The main reason of selecting the R600a is, it is eco-friendly and it is more effective and it consumes less power as compared with

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Topology Optimization of Brake Disc Rotor

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ABSTRACT

A braking system is a safety gadget that gives safety to the passengers to lower the probability of a twist of fate. The braking control or deceleration of an automobile is carried both by the use of a drum brake machine or a brake disc device drum brake system is the conventional machine which an extended braking system results in the less braking efficiency whereas, the disc brake gadget is powerful in comparison to drum brake because it's having a shorter braking system. The main objective is to increase a brake disc rotor with specific profiles additionally it contains vent holes to grow its efficiency. At the same time, the Modelling of the brake disc rotor goes to be using SOLIDWORKS with the aid of taking the BAJAJ PULSAR 150 brake disc rotor dimensions as a reference. The heat dissipation from the brake disc rotor and additionally its capability of resisting structural loads state the efficiency of the design. The Numerical simulation like static structural and thermal analysis will be executed in ANSYS. Total deformation, equivalent strain, equivalent elastic stress, and aspect of protections are to be executed in structural analysis whereas thermal analysis, general warmness flux, and temperature may be executed. Topological optimization might be finished to the brake disc rotor if you want to reduce its weight which is indirectly answerable the increasing its effectiveness.

KEYWORDS: Disc Brake, Staructural Analysis, Thermal Analysis, Numerical Simulation

1. INTRODUCTION

Generally, one of Necessity system required to control the automobile is braking system. They are mainly two systems are employed in automobiles those are drum braking system and disc braking systems. As compared with the disc braking system drum braking system is less efficient because in drum braking system more heat is generated while applying the brakes to the vehicle as compared to the disc braking system. In general, whenever brakes are applied high heat energy produced between brake pads and brake drums in brake drum system. And due to the brake drum system is closed system it is difficult to provide air supply in order to reduce the heat.so in order to overcame this difficulty drum braking system disc braking system is widely used in automobiles because of its effective performance while applying the brakes it provides instant braking to the vehicle with a light weight arrangement which increases the efficiency of the engine and disc is directly contact to the surrounding air so that it is very is to circulate the air and more heat transfer can be archived by using disc brake system in disc braking system heat is transferred through free convection. In this project we are providing slots on in order reduce weight of the disc and also helps to circulate more air through the disc of a disc braking system. Generally cast-iron is manufactured the disc because of its excellent thermal conductivity high heat resistant capacity and long life. In this project we are going heat treated aluminum alloys, carbon fibre reinforced carbon composite(CFRC),steel alloys. In order ease the manufacturing of disc with different slots and to get more heat transfer through the disc heated

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Design and Evaluation of Various Alloy Wheels Using Different Materials

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ABSTRACT

The automobile wheels support the entire weight, resist the strains created during turning, transmit the driving torque for propelling, and braking torque for retarding. The wheels must have well-balanced construction particularly for running at high speeds. Alloy wheels are made of an alloy of Aluminium, carbon fibre, Magnesium, Titanium, etc. Alloy wheels differ from normal steel wheels because of their lighter weight, which improves the steering and so the speed of the car. The major considerations while modelling any new alloy wheel rim are styling, weight, manufacturability, and capability. During this project, different alloy wheels of the car are designed and simulated using analysis software 21 R2. The alloy wheel rim has been designed using SOLID WORKS 2021 SP2.0 software, and afterwards-static structural analysis is finished with different materials, load, and boundary conditions using ANSYS Software. Finally observed results of total deformation, equivalent stress, and equivalent elastic strain on different wheel rims materials and compared with one another.

KEYWORDS: - Alloy wheels, solid works, Ansys

1. INTRODUCTION

In the automobile industry, wheels and tyres are very important. Without the engine, the car may be run but without the wheel, it is not possible. Wheels support the entire weight, resist the strains created during turning and transmit the driving torque for propelling and braking torque for retarding. In the automotive industry, the alloy wheels are made of an alloy of aluminium or magnesium or sometimes a mixture of both [1]. They have greater strength than pure metals, which are generally much soft and more ductile. Alloys of aluminium or magnesium are generally lighter for the same strength, provide better heat conduction, and often produce an improved appearance over steel wheels while steel is the most common material used in wheel production. Steel wheels are heavy, this adds unsprung weight, decreases the agility, and the ability to accelerate lowers fuel economy, and puts a strain on suspension. Whereas alloy wheels are lighter and allow better handling, due to lightweight, there is a lower unsprung mass, which improves fuel economy and puts less strain on the suspension allowing for faster acceleration. As compared to steel wheels, alloy wheels are more expensive to produce.

1.1 TYPES OF ALLOY WHEELS:

Steel and lightweight alloy materials are mostly used in a wheel rim and some composite materials together with glass fibre are used for special wheels[2].

a) Wire Spoke Wheel:

Wire spoke wheel is important where the exterior edge part of the wheel rim and the axle mounting part are linked by numerous wires called spokes. Nowadays automobiles with their high horsepower have made this type of wheel manufacture obsolete.

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Experimental Testing of Jute Aramid and Hybrids of Their Fibers Along with A Snail Shell Powder

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ABSTRACT

The composites have lot of advantages over the traditional glass fiber or mineral filled ceramic materials including low cost, light weight, eco friendliness and recyclability. In this thesis we use fibers called jute, aramid and jute/aramid fiber with epoxy (ly556) and polyester. By using the above mentioned three reinforcements are developed by the variation in the resin mixing. By the combination of all the three fibers we get jute, aramid and jute/aramid fiber with epoxy (ly556) hybrid composites as well as jute, aramid and jute/aramid fiber with polyester. The fabricated six samples are subjected to tensile, flexural, impact, and hardness determine the properties of these composite was made the crossover material which are assessed tentatively as per ASTM norms.

KEYWORDS: Jute fiber, aramid fiber, epoxy resin, polyster resin, snail shell powder

1. INTRODUCTION

Composite materials are a significant type of materials which are presently accessible to humankind in huge amount. Lately, many glass reinforced by fiber composite materials are broadly utilized in the aviation and car businesses. Composite materials are significant for mechanical, chemistry and structural architects, material researchers for utilizing them on a lot of building and different applications. These materials have turned into the option of customary basic materials, for example, steel, wood or metals in numerous applications.

The technological development has increased on advances in the materials field. A random composite material is one, which consists of mixing the particles of the materials working together to produce new metal have properties which are dissimilar to the properties of singular material that they possess. It contains the most important characteristic that the materials are not soluble to each other. Likewise, the random composite material assume the role of the advancements designing material because of their fantastic mechanical properties while being lowweight, minimal cost, and profoundly adaptable. Composite essentially comprises a matrix which around the reinforce in this way the strength and durability is existed that is important in a specific field of utilization. Chopped strand mats are arbitrarily situated, give good strand, great wet ability, and scattering, and show even strength thought every which way. A researcher examined the investigation of mechanical properties of E-Glass fiber chopped strand material with epoxy resin nano clay composites; the point of this work is to dissect the impact of nano clay effect on the mechanical conduct of chopped strand E-glass fiber, strengthened in the matrix of epoxy with filler of nano clay.

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FEA and Material Optimization ofCamshaft

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A camshaft is a rotating element in an IC engine. It is situated either in the head of the engine or lower back of the engine. A camshaft is driven by the crankshaft by means of the timing gears or timing chains or a D.C motor. A camshaft is a metal rod which has lobes mounted on it. These lobes convert rotary motion of the rod into reciprocating motion of the inlet and exhaust valves.

The performance of camshaft mainly depends upon the proper design and material used in camshaft. It is very important to select proper material for camshaft by which efficiency of IC engine can be improved. The various materials used for camshaft are (CS840, C55Mn75, 40Ni 3Cr 65Mo 55). The project is focused on selecting a better material for camshaft by performing finite element analysis.This project studies variation of stresses on the camshaft for different materials. There will be a judgement after comparing the results to find a better material for camshaft. The cad model of camshaft is prepared using SOLID WORKS 2021 SP2.0, the cad model will be simulated in ANSYS workbench R21 for Structural analysis (equivalent stress, equivalent elastic strain, total deformation) and Modal analysis (frequency, deformation).

KEYWORDS: camshaft, Chilled Cast Iron, CS840r

1. INTRODUCTION

A camshaft is a main component in an IC engine. It is a rotating element in a valve train assembly [1]. The purpose of the camshaft is to provide motion to the valves. The camshaft which is driven by the crankshaft via timing chain or timing gears is mounted with lobes called cams. The cams have nose and flank. One end of the camshaft follows the contour of the cam and the other is connected to the valve. The valve is in closed position when the rocker arm is on the heel of the lobe. The valve gradually when the rockerarm follows the opening ramp and the valve is at its peak lift. The camshaft has several lobes called cams they cause the valves to open and close accordingly. The camshaft is driven by the crankshaft by means of a timing chain or gear train. The rockerarm is in continuous contact with the cam, as the camshaft rotates the load continuously varies this leads to the development of fatigue in the camshaft[2]. These fatigue loads cause deformation and bending of the camshaft.

The use of camshaft is very lively in every IC engine except for those that use electronically operated valves. But heavy-duty vehicles and high-performance engines still use camshafts for their reliability[3]. There may one or more camshafts to operate the valves separately. In V-type engines there maybe one or two camshafts per bank. Some heavy-duty engines use D.C motors to drive the camshaft. The camshafts are usually situated in the head called over-head camshafts to avoid additional weight of push rods. There maybe two or more lobes per span depending on number valves per cylinder.

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Design and Analysis of the Multi-Angled Gearless Trasmission System Using Different Materials

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Generally we are using gears for power transmission. But the major problem faced by this technology is wear and tear and complex design. The Project is used for power transmission without gears. And it is called as Gearless transmission system. It is using nut bolt arrangement for rod at different angles power transmission. It is a straight forward procedure, but it is more effective. It is easy to manufacture. This saves gear manufacturing time and costs along with teeth matching and gear placement issues. This mechanism is an efficient design of gearless transmission technique and the kinematic system that allows for efficient power/motion transmission at acute and abuse angles.

The stress analysis on rod at different angles i.e., at 0, 30, 60 and 90 degrees is to be observed to obtain the safe conditions and also observed deformation analysis on the link. The stress and strain analysis of links and also compared with different materials is analysed at same angles.

Power is transferred from the input shaft to the out put shaft through sliding links that creates a revolute pairwith the hub. Links bent at required angle slide inside the holes in the hub.

KEYWORDS: Power Transmission, Finite-Element-Analysis

1. INTRODUCTION

One of the most important design issues for a transmission system is power transmission. Gears are the most frequent power transmission devices used to transfer mechanical power from one location to another. They are located between two non-parallel shafts. Gears, on the other hand, are commonly regarded as the most efficient means of power transmission between shafts. The gear, on the other hand, is heavy and requires more power to transport the electricity from the power plant to the destination.

However, to maximise power transmission efficiency, these systems can only be employed under low loading conditions and with smaller components.There are two types of gearless transmissions: 1. Fixed angle transmission and 2. Flexible (or) multi-angled transmission.

Fixed angle transmission is when the mechanism can only transmit power when the shafts are aligned at a specific angle.In a multi-angle gearless transmission, power is transmitted between two shafts that change angles between operations (or are fixed in various angles before the operation begins.The mechanism was designed in CATIA V5 for 3D part design and assembly, and the analysis was done in ANSYS simulation software. Virtual design and analysis are the simplest, fastest and more efficeant wat to create first same of the design we desire to develope.

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Experimental Mechanical Characterization of Aluminium Based Metal Matrix Composites Using Al-6061

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ABSTRACT

Metal Matrix Composite materials are widely used in a variety of applications such as aerospace, automotive and structural components resulting in savings of material and energy. Particulate reinforced Aluminium metal matrix composite materials which are having desirable properties such as high specific stiffness, high specific strength, high coefficient of thermal expansion, increased fatigue resistance and superior dimensional stability compared to unreinforced alloys. In the present work, an attempt has been made to develop composites using Al 6061 as a matrix material reinforced with Al_2O_3 particulates using the stir casting technique. The reinforcement particulates were varied in steps of 2%, and 4%. The Specimens were prepared as per the ASTM standards. The prepared composites were characterized by using tensile strength and hardness properties were evaluated. Reinforcements particles are added and were distributed homogeneously in the aluminium matrix at 2%and 4% Al_2O_3. The tensile and hardness properties were higher in the case of composites when compared to the unreinforced Al 6061 matrix. Also increasing the addition level has resulted in a further increase in both tensile strength and hardness values and optimum value was obtained.

KEYWORDS: Accuracy configurable, approximate multiplier, area-efficient, low energy, scalable, truncating

1. INTRODUCTION

Conventional monolithic materials have limitations in achieving a good combination of strength, stiffness, toughness and density. To overcome these shortcomings and to meet the ever-increasing demand of modern-day technology, composites are the most promising materials of recent interest. Metal matrix composites (MMCs) possess significantly improved properties including high specific strength; specific modulus, damping capacity and good wear resistance compared to unreinforced alloys. There has been an increasing interest in composites containing low density and low-cost reinforcements. Among various discontinuous dispersoids used, fly ash is one of the most inexpensive and low-density reinforcement available in large quantities as a solid waste by-product during the combustion of coal in thermal power plants. Hence, composites with fly ash as reinforcement are likely to overcome the cost barrier for widespread applications in automotive and small engine applications. It is therefore expected that the incorporation of fly ash particles in the aluminium alloy will promote yet another use of this low-cost waste by-product and, at the same time, has the potential for conserving energy-intensive aluminium and thereby, reducing the cost of aluminium products. Nowadays the particulate reinforced aluminium matrix

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Electrolyte Flow Analysis of Electrochemical Machining Using CFD

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ABSTRACT

Electrochemical machining is one of the most common unconventional machining process which is mostly used for machining extremely hard materials.In electrochemical machining process tool is taken as cathode and workpiece is taken as anode.An electrolyte of reactive manner is made to flow over tool and workpiece .This electrolyte tends to undergo boiling and passivation because of heat generated during machining.This project aims to design the machine setup by taking four different tools.The project is designed in ansys modeller and then analysed in ANSYS CFX to get results.So that we can decide which tool shape is best for machining in electrochemical machining process.

KEYWORDS: Electrochemical machining, Passivation, Ansys.

1. INTRODUCTION

Electrochemical machiningprocess is a type machining processin which a voltage applied between two electrodes. The tool and workpiece are always arranged such that there is a gap exists between them.The electrolyte flows in this gap and because of the heat generated during the machining electrolyte boils and causes passivation effect which causes defects in the final shape of workpiece and marks out to be a defect.The electrolytes typically that are used in electrochemical machining are Hcl, Strong alkaline solutions,Nacl etc.The electrolyte that we are using is 30% brine solution and the workpiece shape is taken as cylindrical with the material of Cast Iron and tool is considered to made with copper and four different shapes are taken in for analysis. First the machine setup is designed in ansys design modeller and then analysed in ANSYS CFX software. The inlet velocities that are taken as input are 30,37 and 42m/s.

STRUCTURE OF PAPER

The paper is organized as follows: In Section 1, the introduction of the paper is provided along with the structure, objectives and related work. In Section 2, materials and methodology are defined. In Section 3, we discussed modelling and analysis.Section 4 shares information about the results that have obtained. Section 5 gives the conclusions that are concluded from the work. Section 6 tells us about the future scope and concludes the paper with references.

1.1 OBJECTIVES

In case of intricateworkpieces, it's really hard to the machinine the components accurately. So there is a needto understand about those parameters (parameters related to flow pattern). Once the flow patternis known, then it's easy to design the tool and avoid passivation.

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Optimization of Cutting Parameters in Turning of EN24 Steel by Using Taguchi's Method

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ABSTRACT

The purpose of this research is to investigate EN24 steel utilizing the Taguchi optimization approach for optimum material removal rate and minimal surface roughness when turning EN24 steel with an HSS tool on an Engine lathe machine. Randomly selecting cutting parameters has a significant impact on final output reactions such as surface roughness, tool life, and other workpiece and tool attributes. Three various turning process parameters, such as Cutting Speed, Feed Rate, and Depth of cut, are investigated for optimization in this work by altering them on three levels. Because it decreases the number of tests, the Taguchi technique is a suitable approach for optimizing various machining settings. As a result, an appropriate orthogonal array was chosen, and experiments were conducted. The MRR and surface roughness were assessed and the signal to noise ratio estimated once the trials were completed. Optimal values and confirmation experiments were determined using graphs. To identify the ideal settings and examine the influence of the cutting parameters on maximum material removal rate and minimal surface roughness, a further analysis is done.

KEYWORDS: Optimization, CNC Turning, Taguchi's Method, L9 Orthogonal Array, Spindle speed, depth of cut, Feed Rate

1. INTRODUCTION

Manufacturing is a phrase used to describe the process of turning a finalized design into physical real-world goods or components. A manufacturing process with numerous factors is studied, and each parameter chosen for manufacturing the product determines the degree of acceptability and rejection of the finished product. Identifying the optimal mix of factors involved in a manufacturing process is a necessary step before starting the process.The key problems of the metal-based sector are increasing productivity and improving the quality of machined products; there has been a greater interest in monitoring all elements of the machining process.Turning is a type of machining that involves cutting away undesirable material in order to generate rotatable pieces. A turning machine or lathe, a work piece, a fixture, and a cutting tool are all necessary for the turning process. The work piece is a pre-shaped piece of material that is fixed to the fixture, which is then attached to the turning machine and rotated at high speeds. The cutter is usually a single-point cutting tool that is locked into the machine.

EN24 is a medium-carbon low-alloy steel that is commonly used in the production of automotive and machine tool parts. Large cutting pressures, high cutting tool temperatures, poor surface smoothness, and built-up edge development are all issues in EN24 steel machining due to its low specific heat and tendency to strain-harden and diffuse between tool and work material. As a result, this material is tough to process.The nose radius is one of the most essential elements in tool geometry. It strengthens the tool point by thinning the chip near the tool's point and spreading it over a larger area of the

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Fabrication, Design and Analysis of Minor Losses in Pipe

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ABSTRACT

This project needed to investigate the effects of fluid flow due to sudden contractions and sudden expansions of the pipe network. The purpose of this project is to demonstrate that Bernoulli's equation cannot correspond to, and by comparing the results of experiments involving sudden contraction and sudden expansion of with each other and with theoretical data, these Predict how the liquid will behave in a situation. The experiments were conducted in two different modes, one causing a sudden contraction of water through the tube and the other causing a sudden swelling through the tube. This project needed to investigate the effects of fluid flow due to sudden contractions and sudden expansions of the pipe network. The purpose of this project is to demonstrate that Bernoulli's equation cannot correspond to, and by comparing the results of experiments involving sudden contraction and sudden expansion of with each other and with theoretical data, these predict how the liquid will behave in a situation. The experiments were conducted in two different modes, one causing a sudden contraction of water through the tube and the other causing a sudden swelling through the tube.

KEYWORDS: Computtive fluid dynamics, Vertual analysis,Gambit software, Computational fluid dynamics, fluent software, expansion, contraction, bend in pipe, obstracle.

1. INTRODUCTION

Two-phase flow is used in a number of industries, such as power generation, refrigeration, distillation, steelmaking, papermaking, and food processing. Since it is still not possible to describe the detailed physics of the flow mechanism for biphasic flow, the pressure drop and the horizontal contraction and expansion are usually best approximated from the relationships experiment. Therefore, reliable estimates of the hydrodynamic properties associated with this type of flow are considered essential for the safe, economical design and efficient operation of two-phase flows. In recent years, several papers have been published on the flow of two-phase gas/liquid.

Freon 12 could be used in a variety of situations. Based on momentum and mass balance as well as their experimental results, they developed a model is used to determine the two-phase pressure drop considering the generally considered acceptable flow characteristics. Based on the solution of one-dimensional conservation equations downstream of the enlargement, Attou et al. developed a semi-analytical model for two-phase pressure drop in rapid enlargements. They evaluated the predictions of three models, including relatively homogenous flow, frozen flow, and bubbly flow, to experimental data and determined that the bubbly flow model had the best consistency [1] .

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Fabrication and Experimental Testing of Kevlar, E-Glass and Chopped Mat Fibres Reinforced with Epoxy LY556, Hardener HY951 and TiO_2

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ABSTRACT

Fiber materials have been widely used for several years and their market share is continuously growing. Composite fibers are lightweight and environmentally friendly as well as low cost compared to traditional engineering materials. The primary aim of this study was to using Kevlar, E-glass and Chopped mats along with titanium oxide (TiO_2). By using the above mentioned three reinforcement with epoxy resin we will be provided with combinations of Kevlar/E-glass, E-glass/Chopped mat and Carbon /Kevlar hybrid composites. By the combination of all the three fibers we get E-glass /Kevlar/Caron fiber hybrid composites. In all compositions commonly 10% of Titanium oxide powder used.Testing such as tensile, flexural, impact, and hardness determine the properties of these composite was made the crossover material which are assessed tentatively as per ASTM norms.

KEYWORDS: Kevlar fiber, E-glassfiber, Chopped mat fiber, Epoxy LY556, Hardener HY951, and Titanium oxide.

1. INTRODUCTION

Composite materials are a significant type of materials which are presently accessible to humankind in huge amount. Lately, many glass reinforced by fiber composite materials are broadly utilized in the aviation and car businesses. Composite materials are significant for mechanical, chemistry and structural architects, material researchers for utilizing them on a lot of building and different applications. These materials have turned into the option of customary basic materials, for example, steel, wood or metals in numerous applications.

The technological development has increased on advances in the materials field. A random composite material is one, which consists of mixing the particles of the materials working together to produce new metal have properties which are dissimilar to the properties of singular material that they possess. It contains the most important characteristic that the materials are not soluble to each other. Likewise, the random composite material assumes the role of the advancements designing material because of their fantastic mechanical properties while being low weight, minimal cost, and profoundly adaptable. Composite essentially comprises a matrix which around the reinforced in this way the strength and durability is existed that is important in a specific field of utilization. Chopped strand mats are arbitrarily situated, give good strand, great wet ability, and scattering, and show even strength thought every which way. A researcher examined the investigation of mechanical properties of E-Glass fiber chopped strand material with epoxy resin nano clay composites; the point of this work

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Experimental Analysis and Comparative Study on Performance of Domestic Refrigerator Using R134aby Varying Capillary Size and Length

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ABSTRACT

The study of the expansion device in simple vapor compression refrigeration system is necessary to understand the parameters which can augment the overall performance of system. It is essential to study the effect of capillary tube on the performance of refrigeration systems.A domestic refrigerator test rig charged with R134ais used to find out the effect of capillary tubes in Co-efficient of Performance(COP) of the refrigerator. Capillary tubes of sizes 3.1mm and 3.6mm of length 1500mm and 1800mm and 2130mm(6feet) and 2743(9 feet) are used. The findings of the experimental study show that the COP for the refrigerator is maximum for 3.6mm dia capillary tube when compared to 3.1mm dia in both the lengths.The values of COP are compiled in C complier to check for the accuracywith the calculations and also optimization technique is used in C compiler to find out the optimal COP amongst the obtained COP's. The inlet and outlet temperatures of the test rig parts, suction and discharge pressures of compressorare measured and used to calculate the COP. The experimental work shows that, capillary of bigger size gives out the higher COP for the refrigerator.

KEYWORDS: Co-efficient of Performance, Capillary tube, suction and discharge pressures, R134a, Optimisation

1. INTRODUCTION

Vapour Compression Refrigeration Cycle is the most widely used refrigeration system. In this system, the working fluid is a vapor. It readily evaporates and condenses or changes alternatively between the vapor and liquid phase without leaving the refrigerating plant.

During evaporation, it absorbs heat from the cold body and this heat is used as its latent heat for converting it from liquid to vapour whereas in Condensing or cooling, it rejects heat to external bodies, thus creating a cooling effect in the working fluid.

Components of Vapour Compression Refrigeration Cycle(VCR):

1. Compressor
2. Condenser
3. Expansion device
4. Evaporator

Thiscyclerequiresthe addition of external work for its operation. Basically, itconsistsoffour processesnamely:

- Isentropiccompression.
- Constantpressureheatrejection.

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Experimental Investigation of AL-ZrO2-Gr Composite Material by using Powder Metallurgy Process

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ABSTRACT

Traditional solid materials have limits in accomplishing a great mix of solidarity, firmness, strength, and thickness. Composites are the most encouraging materials of late interest to defeat these inadequacies and satisfy the consistently expanding need for advanced innovation. The current examination work includes the investigation of Al 5052-Zro2-Gr composite through powder metallurgy. This technique includes the development of fortifications inside the grid by the synthetic response of at least two mixtures which likewise creates a few changes in the lattice material inside the area. Zirconium dioxide (Zro2) was the fortification in the grid of Al 5052 composite which can be reasonable for space, airplane, and auto parts at raised temperatures. The mechanical properties as far as hardness and effect test was completed. The example of the Al 5052 compound was additionally projected and tried for correlation.

KEYWORDS: Al 5052 Alloy, Zro2-Zirconium Dioxide, Gr-Graphite, Metal Matrix Composite, Nano Composites.

1. INTRODUCTION

Composites are artificial materials comprising of at least one broken stage having close contact with one another, with the cognizable point of interaction between them. These are multifunctional materials frameworks that give qualities not reachable from individual stages. Further, composites are tailor-made to be financially savvy, property powerful, and application-arranged [1]. By and large, the broken stage is more diligent and more grounded than the ceaseless stage and is known as the reinforcement. While the persistent stage is named the 'framework the framework holds support to shape the ideal shape and bears a significant part of an applied burden, while the support works on the by and large mechanical properties of the lattice [5]. Support builds the Strength, solidness, wear opposition, and temperature obstruction limit and brings down the thickness [8].

CLASSIFICATION OF COMPOSITES

In general, composites are classified according to the type of matrix material and then the nature of reinforcement at two Distinct levels. Based on the type of matrix material

1. Metal-matrix composites (MMC):

MMCs are innovations during the early60, made out of fundamentally a metallic Matrix built up wgeally ceramics.

2. Polymer-matrix composites (PMC):

Contain are reinforcing fibers and building up filaments like glass strands, aramid, and so forth. Low densities, great erosion obstruction, low warm conductivities, and

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Evaluation of Mechanical and Water absorption properties of Fly ash filled High Density Polyethylene Composite produced by Compression Molding

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ABSTRACT

Composite materials emerged in the middle of the twentieth century as a promising class of engineering materials providing new prospects for modern technology. The wide range of property values attained with composites and the ability to tailor the properties is an advantage. Now a days composites are used in many areas like automobile, transportation and aerospace, etc. due to having unique properties like light weight, better strength, low maintenance, high strength to weight ratio. Polymer matrix composites with filler material as reinforcement have better properties than natural fiber reinforced composites. Utilization of inorganic filler materials obtained from waste has gained an importance due to burden on environment. One of such is utilization of fly ash particles which are interesting because of their low density, low cost, strong filling ability, and smooth spherical surface. In this present project work, A polymer matrix composite was fabricated by compression molding process with fly ash as filler material ranging from 5% to 25% by weight and high-density polyethylene (HDPE) as matrix material with constant applied load on the composite. The fabricated composite was tested for mechanical properties such as tensile strength, impact strength, flexural strength and hardness as per ASTM standards. Water absorption test was also carried out for water absorption rate. The results indicated that increasing the amount of fly ash content up to 25 % improves the hardness, tensile, flexural and impact strength of the composites. But the tensile strength was gradually decreases with the after 10% increment of fly ash in HDPE composite. It can be also observed that water absorption rate has increased with an increase of fly ash proportion.

KEYWORDS:High density polyethylene, Fly ash, Tensile strength, Hardness, Water absorption.

1. INTRODUCTION

Composite materials have attracted more interests in various potential applications in last decades such as aerospace, military, automotive and many other industries. These become most popular due to their excellent properties like Light weight, Ease of fabrication, High corrosion resistance, High wear resistance, High strength and stiffness, better strength to weight ratio, etc. [1]. Composite material is defined as the combination of two or more materials with different properties, without dissolving or blending them into each other. It consists of majorly two constituents; one is Matrix material and another one is Reinforcement material. The matrix holds the reinforcement to form the desired shape while the reinforcement improves the overall mechanical properties of the matrix. When designed properly, the new combined material exhibits better strength than would each individual material. Although, matrix

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Experimental Investigation of Mechanical Propertiesof Al-6061 Metal Matrix Composites

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ABSTRACT

Metal Matrix Composite materials are widely used in a variety of applications such as aerospace, automotive and structural components resulting in savings of material and energy. Particulate reinforced Aluminium metal matrix composite materials which are having desirable properties such as high specific stiffness, high specific strength, high coefficient of thermal expansion, increased fatigue resistance, and superior dimensional stability compared to unreinforced alloys. The main objective of our project is to make a material consisting of aluminum with a grade of 6061(Al6061), silicon carbide (Sic), and graphite powder by the stir casting manufacturing method. And evaluated fabricated composite material also the determined microhardness,wear resistance, and tensile strength.

KEYWORDS:Al 6061,Sic,Gr powder,Stir casting,Metal matrix

1. INTRODUCTION

I.COMPOSITES:

Composites are manmade materials consisting of one or more discontinuous phases having intimate contact with each other, with the cognizable interface between them. These are multifunctional materials systems that provide characteristics not obtainable from individual phases. Further, composites are tailor-made to be cost-effective, property effective, and application-oriented [1].

In general, the discontinuous phase is harder and stronger than the continuous phase and is called the 'reinforcement whereasthe continuous phase is termed the 'matrix'. The matrix holds reinforcement to form the desired shape and bears the major portion of an applied load, while the reinforcement improves the overall mechanical properties of the matrix. Reinforcement increase the strength, stiffener-resistanttemperaturetant agent resistance capacity, and lowerdensity.

CLASSIFICATION OF COMPOSITES:

In general, composites are classified according to the type of matrix material and then the nature of reinforcement at two distinct levels.

1. Polymer Matrix Composites.
2. Ceramic Matrix Composites.
3. Metal Matrix Composites.

These are the three types of composites.

PROCESSING OF COMPOSITES

Depending upon the application in service, a variety of composites with different combinations of matrix materials and reinforcements are being produced through different fabrication methods, various systems,

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Evaluation of Tensile Properties of Epoxy Composites Reinforced with combined hand layup of Sisal and Kenaf fibers

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ABSTRACT

Natural fiber composite materials are replacing the conventional materials as these materials are biodegradable, eco-friendly, durable, high strength to weight ratio, etc. Due to this, natural fiber composite materials are coming into the limelight and several types of research are going on in the improvement of these composites. There are several methods and procedures included in the preparation of different composites for different applications. This project is based on the usage of the hand layup technique in the fabrication of epoxy resin natural fiber composite made by using sisal and kenaf fibers in multiple layers as reinforcement material. In this composite, we use epoxy LY556, hardener HY951, and treated sisal and kenaf fibers. Two samples of composites and prepared and tensile properties of these two samples are tested and evaluated. These two samples are varied in their preparation. One sample is prepared by placing the fibers in unidirectional and the other sample is prepared by placing the fibers in bidirectional i.e., 0, 90 positions. These two samples are tested and compared.

KEYWORDS: Natural fiber composite material, hand layup technique, epoxy LY556, hardener HY951, Sisal and Kenaf fibers, Unidirectional,Bidirectional,tensile properties.

1. INTRODUCTION

The usage of natural fiber composite materials is increasing day by day due to its wide range of characteristics. Due to these characteristics, there isa wide range of applications in different sectors, ranging from the preparation of furniture, construction material, packing, and automobile parts.[1]Synthetic fiber composite materials are used for several years because of their high strength and adaptability in replacing metals in different fields such as automobiles, but these materials are hard to recycle as the separation of components after their life span is quite difficult. Therefore, these components are disposed of improperly by incineration and disposing in dump yards, etc., so due to these reasons, the natural fiber composites have gained huge importance due to their biodegradability and are eco-friendly[2]. Natural fibers are plant-based fibers that are acquired by extracting fiber from plants. Natural fibers are used in three different ways. They are:

- In textiles, paper, and fabrics;
- For biofuel;
- Reinforcement materials for composites[3].

There are three different origins of natural fibers. They are:

- Animal Fibers;

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Mechanical Properties Characterization of Fiber Reinforced Composite Material

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ABSTRACT

Composites had been charming all of the regions of engineering. Different styles of composites had been investigated. The gift paintings focus on hybrid composites bolstered with fly ash and silica Fly ash is a waste product received from thermal electricity stations. In the prevailing paintings investigations are achieved on a hybrid polymer composites containing glass fiber reinforcement, epoxy resin, fly ash and nano silica has been achieved. Epoxy glass composites with distinctive measures of fly ash have been synthetic with the aid of using the hand lay-up method. The newly evolved composites are subjected to numerous methods to observe their mechanical behavior. Tensile check, Compression check, Flexural check, and Vickers hardness check have been carried out as in step with the ASTM requirements to discover the have an effect on of filler fabric on mechanical traits of GFRP composites. The distribution and interplay of constituent substances play a chief function of their residences. The evaluation showed the extrade in residences of the GFRP regarding the proportion of fly ash gift with inside the composite fabric. From the experimental outcomes received, it changed into observed that the mechanical residences have been more desirable whilst the fly ash percentage changed into elevated and additionally amongst those chances of fly ash, the specimen having 9% changed into owning maximum residences.

KEYWORDS:GFRP,Epoxy Composites, Tensile Test,Fly Ash,Flexural Test

1. INTRODUCTION

Composite material prepared by mixing two (or) more different elements in order to make the resulting material having superior properties from its parental materials. Composite materials are widely used in industry due to their unusual properties. There are several kinds of composite materials classified according to matrix type. One of the most important types of composites materials is polymer matrix composite(PMC)materials. Polymer matrix composites (PMCs) have received more remarkable attentio than conventional polymer materials. They have widely used for many applications in industry because of their lightness, high strength, high wear resistance and specific mechanical properties.

TYPESOF COMPOSITES:

A. Accordingto typeofcontinuous phase

- MetalMatrixComposite(MMC)
- CeramicMatrixComposite(CMC)
- PolymerMatrixComposite(PMC)

B. Accordingtotypeofreinforcement.

- fibrous composites
- particulate composites

2. REALATED WORK

Related work needs to be done in order to understand the background information available, the work already done and also to show the relevance of the current

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Fabrication of Aluminium Metal Matrix Composite and Optimization of Various Process Parameters of Machining

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ABSTRACT

Now a days, metal matrix composites are playing a pre-dominant role in manufacturing of various components due to its superior mechanical properties and good corrosive resistance. Machining of these composites is a challenging task due to addition of hard reinforcement particles in the matrix material. Aluminum alloys are widely used for commercial applications of transportation, aerospace, construction, naval vessels manufacturing and similar engineering industries. In the present work, Al $T_i B_2$ is fabricated by using stir casting process and machining is carried out to investigate the influence of various process parameters on machining. A Face Centered Central Composite design of RSM is employed to carry out the experimentation and to develop predictive equations for Metal removal rate and Surface finish. Further RSM is applied for optimization of process parameters.

KEYWORDS:Fabrication,Optimization,Turning,RSM,ANOVA.

1. INTRODUCTION

Constant research is carried out to reduce weight and wear rate and to improve specific strength of metallic components used in numerous industrial appliances and machinery. The lighter aluminum alloys reinforced with a range of ceramic particulates, classified as aluminum matrix composites (AMCs), offers a solution to increase the working range of materials[1]. A metal matrix composite system is generally designated simply by the metal alloy designation of the matrix and the material type, volume fraction, and form of the ceramic reinforcement. Metal Matrix composites (MMCs) are the combination of two or more distinct phases that has improved properties than the monolithic alloy. The application of MMC's greatly increasing due to their high strength and toughness at elevated temperatures coupled with low-density.Metals are extremely versatile engineering materials. A metallic material can exhibit a wide range of readily controllable properties through appropriate of alloy composition and thermomechanical processing method[2]. The extensive use of metallic alloys in engineering reflects not only their strength and toughness but also the relative ease and low cost of fabrication of engineering components by a wide range of manufacturing processes[3]. The development of MMCs has reflected the need to achieve property combinations beyond those attainable in monolithic metals alone. Thus, tailored composites resulting from the addition of reinforcements to a metal may provide enhanced specific stiffness coupled with improved

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Performance Analsyis of Mixing Chamber of a Ram Jet Engine

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ABSTRACT

A ram jet engine sometimes referred to as a flying stovepipe or an athodyd is a form of airbreathing jet engine. That uses the engines forward motion to compress incoming air without an axial compressor or a centrifugal compressor. Mixing chamber is the place where the oxidizer and fuel is mixed. In the mixing chamber proper oxidizer and fuel ratio is required for efficient combustion. Mixing chamber plays an important role in combustion process. A fuel is a substance that burns when combined with oxygen producing gas for propulsion. An oxidizer is an agent that releases oxygen for combustion process. The ratio of oxidizer to fuel is called the mixture ratio. In this project performance of oxidizer and fuel mixing chamber will be analyzed.

KEYWORDS: Ramjet engine, Oxidizer, mixture chamber, mixture ratio, Combustion.

1. INTRODUCTION

Ram jet was air breathing jet engine that operates with no major moving parts. It relies on the crafts forward motion to draw in air and on a specially shaped intake passage to compress the air for combustion is self-sustaining. As in other engines, forward thrust is obtained as a reaction to the renaward rush of hot exhaust gases. Ram jets work best at speeds of mach2 and higher. Since ramjets develop no static, some means of launching them at high velocity is required. The Brayton cycle is a thermodynamic cycle that describes the working of the gas turbine engine and others. It is named after George Brayton the American engineer who developed it, although it was originally proposed and patented by Englishman john barber in 1791. It is also sometimes known as the joule cycle. A ramjet is designed around itsinlet. An object moving at high speed through air generates a high-pressure region up stream. A ramjet uses this high pressure in front of the engine to force air through the tube, where it is heated by combusting some of it with fuel. It is then passed through a nozzle to accelerate it to the supersonic speeds.

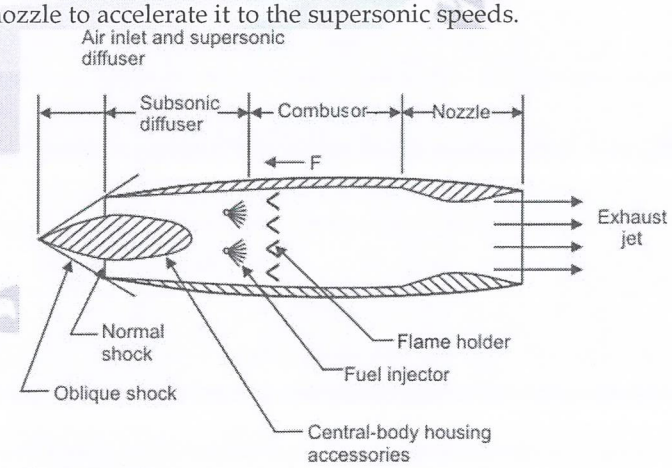

Fig:1. Ramjetengine

This acceleration gives the ramjet forward thrust. constant inlet speed of Mach 0.5 (170 m/s; 610 km/h). In this paper we are doing research on performance analysis of mixing chamber of ram jet enine by the help of air and fuel supply system to mixing chamber.

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Design and Fabrication of a Monolithic Compliant Grass Hopper Mechanism

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ABSTRACT

A monolithic compliant mechanism is a single component jointless mechanism that is extensively being used for precision applications such as biomedical, and nanotechnology applications due to the absence of friction wear lubrication,and backlash issues. Compliant mechanisms are mainly used to enhance or lower the displacement of magnification ratios. In thispaper design and analysis of the compliant Grasshopper's mechanism for the linear displacement application is presented. Finite element analysis of the mechanism was carried out using solid works to obtain the linear displacement and stresses. The results obtained for linear displacement were validated with the actual displacement obtained for the working prototype mechanism for the materials.

KEYWORDS:Compliant Mechanism, Backlash, Grass Hopper Mechanism

1. INTRODUCTION

Compliant mechanisms are flexible single-piece structures that produce the desired movement by going through elastic deformation [1]. A mechanism is a mechanical device used to transfer force, energy, and motion. But Compliant Mechanism is a monolithic structure that elastically deforms without any link and joint to produce a desired force or displacement. It is an elastic continuum that is used to transmit or transform force and motion mechanically. Rigid-body mechanisms have rigid links connected at movable joints [2]. Unlike rigid-body mechanisms, compliant mechanisms gain some of their mobility from the deflection of flexible members rather than movable joints only. Stiffness is a measure of load per unit deflection, whereas strength is how much load can be endured before failure. Despite human tendencies, it is possible to make things that are flexible and strong. Nature uses stiff structures where needed (tree trunks, bones, teeth, and claws) but in living organisms, it more often relies on flexibility. Bee wings, bird wings, tree branches, leaf stems, fish, and single-celled organisms are only a few examples of creations that use compliance to their advantage [3]. The contrast between nature and human design is easily identifiable when humans try to replace one of nature's products. For example, a human heart valve is a compliant one-way valve that is capable of sustaining billions of cycles without failure [4]. However, most current artificial heart valves use several assembled stiff parts with pin joints to obtain motion. They also have a comparatively shorter life, because of difficulty in blood flow, and often damage blood cells. Systems with concentrated compliance behave like classic rigid link mechanisms, where kinematic joints are replaced with flexible hinges, and in consequence, methods conceived

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Design and Analysis of Disc Brake for Bolero using Different Materials of Al-MMCs

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ABSTRACT

In a car system, we are having many safety systems. In that the most critical system in the vehicle which is brake systems. Without brake system in the vehicle will leads to the passenger in unsafe position. Therefore, it is must for all vehicles to have proper brake system. In this project we use Al-MMC materials for calculating normal force, shear force and piston force. The standard disc brake for bolero model designed using CATIA and the Static analysis will be done in ANSYS also calculate the stress, strain, deformation of disc brake model. This is important to understand action force and friction force on the disc brake new material, how disc brake works more efficiently, which can help to reduce the accident that may happen in each day

KEYWORDS: Al-MMC ,CATIA, ANSYS, Static analysis, Stress, strain ,Friction.

1. INTRODUCTION

If looking on the overall automotive parts, besides engines, there are more crucial parts that engineers need to look into consideration. Suspension, brake, electrical, hydraulic and gear are all the crucial systems in the automotive areas. Each of all system has their own functionality, which brings life to the automation industries. Brakes is such a crucial system in stopping the vehicle on all moving stages including braking during high speed, sharp cornering, traffic jam and downhill. All of those braking moments give a different value of temperature distribution and thermal stress. Good performance of disc brake rotor comes from good material with better mechanical and thermal properties. Good designs of disc brake rotor are varying across the range of the vehicles. There are different design and performance of disc brake rotor if compared between passenger, commercial and heavy duty vehicle. There are also other constraints such as cost, weight, manufacturing capability, robustness and reliability, packaging, maintenance and servicing.

For example, heavy-duty vehicle need large size of disc brake rotor if compared to passenger vehicle. Due to that, it will increased total weight ofvehicle as well as fuel consumption and reduces performances of the vehicle. Moreover, high weight of vehicle induces to high temperature increased during braking where the higher value of temperature during braking could lead to braking failure and cracking of disc brake rotor.

This project concerns of the temperature distribution and constraint of the disc brake rotor. Most of the passenger cars today have disc brake rotors that are made of grey cast iron. Grey cast iron is chosen for its relatively high thermal conductivity, high thermal diffusivity and low cost. In this project, the author will investigate on the thermal issues of normal passenger

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Railway Track Crack Detection and Alert System GSM& GPS

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ABSTRACT

The Indian railways has one df the largest railway networks in the world and it provides the most importa transport in india which is most commonly used and cost – effective long – distance transport system of the co problem about a railway analysis is detection of cracks on track. If these damages are not controlled at early s lead to a number of derailments resulting in a heavy loss of life and property.

In this work we are introducing a project that aims in designing robust railway crack detection scheme (R Sensor. This avoids the train accidents by detecting the cracks on railway tracks. The Robotic model is designe which sends pictures and live videos. And also capable of alerting the authorities in the form of SMS mess location by using GPS and GSM modules. The system also includes distance measuring sensor which displays th distance between the two tracks. This will save several trains in India from unwanted damages from the rail tra

KEYWORDS: Arduino, GSM module, GPS module, DC motor, motor driver, IR sensor.

1. INTRODUCTION

Transport is very important to carry the passengers and goods from one place to another. The better transport leads to more trade. Economic level is mainly depends on increasing the capacity and level of transport. This paper presents an implementation of an efficient and cost effective solution suitable for railway application. The project relates to the detection of cracks in the railway tracks using IR sensor. According to a possible embodiment, the railway carriage carrying the control equipments is provided with sensor orientated to detect the crack. This project pertains to a process for monitoring the condition of rail on train tracks and more specifically has the object of the identification of defects detected by monitoring equipment on the tracks to be checked to allow maintenance crews to subsequently find these defects. Two IR sensors are fixed ne the train is used to find out the crack o sensor will produce the signal related p rail. If the track is said to be normal on it both the sensor gives the constant se anyone misses their output condition to f defect on that side. It will inform this b Where sensors and alarm should co microcontroller I/O lines and mic programmed to our needs.

The 60% of accidents in railways ar problems which lead to derailment. This the system for automatic crack detect tracks.

India has one of the world's largest rai manual Inspection and detecting a c

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Mechanical & Physical Characterstics of Ricehusk Ash in Aluminum Metal Matrix by Conventional Stir Casting

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ABSTRACT

The application of low-cost material reinforced metal matrix composites is growing rapidly in various engineering fields. Rice Husk Ash Reinforced in Aluminum Metal matrix indicates the possibilities of reinforcing aluminum with locally available inexpensive rice husk ash for developing new material, an agricultural by-product with a high amount of silica. This article shows is to fabricate the composite material consists of pure aluminum and adding Rice husk ash by stir casting method with 8%,12%,15% composition of rice huskparticles in aluminum metal matrixandthe mechanical and physical properties such as tensile strength, compressive strength, hardness, heat treatment, corrosive and wear resistance are measured. The results indicate that the tensile, compressive, heat treatment and hardness is increases by increasing ricehuskparticles and corrosive resistance and wear resistance are decreases.

KEYWORDS: Rice husk ash particles, aluminum, corrosive resistance, wear resistance, tensile and compressive.

1. INTRODUCTION

Composites are manmade materials consisting of one or more discontinuous phases havingintimate contact with each other, with are knowable interface between them. Theseare useful material systems provide characteristicsnotobtainablefromindividualphases.Further, composites are tailor made to, cost-effectivepropertyeffectiveandapplication oriented.Ingeneral,the discontinuous phase is harder and stronger than the continuous phase and is called the 'reinforcement'; whereas continuous phase is termed as the 'matrix' [1]. Thematrixholds reinforcement to form the desired shape and bears the major portion of an applied load, while. Reinforcement improves overall mechanical properties of the matrix. Reinforcement increasesthe strength, stiffness, wear resistant and the temperature resistance capacity andlowersthedensity. In general; composites are classified according to the type of matrix material and then nature of reinforcement at twodistinctlevels [2]. Thefirst classificationincludesceramicmatrixcomposites (CMCs),organicmatrixcomposites (OMCs)andmetal matrixcomposites (MMCs).The termorganic matrixcompositesgenerallyassumetoincludepolymerMat

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Research Article

Influence of Dimethyl Carbonate and Dispersant Added Graphene Nanoplatelets in Diesel-Biodiesel Blends: Combustion, Performance, and Emission Characteristics of Diesel Engine

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The aim of the current study is to investigate the combustion, performance, and emission characteristics of a diesel engine adopting graphene nanoplatelets and 10% *v*/*v* dimethyl carbonate as fuel additives in a 30% biodiesel and 70% diesel blend. The novel findings are documented in the subsequent sections. The surface modification of graphene nanoplatelets using a lipophilic surfactant was used which gave highest stability in fuel samples which is a main distinctive in this research work. Nanofuels were prepared using 30, 60, and 90 ppm concentrations of nanoparticles through ultrasonication. The behaviour of graphene nanoplatelet was characterized using field emission scanning gun-electron microscopy, high-resolution transmission electron microscopy, Fourier transform infrared, and X-ray diffraction. A diesel engine having uniform speed of 1500 rpm was used for the experiment at various load conditions to assess the engine operating parameters for all the prepared samples, including baseline diesel. It was observed that the combustion characteristics were found to be greatly enhanced, such as cylinder pressure and heat release rate, increased by about 15.45% and 9.63%, respectively, for B30GNP60DMC10 sample than diesel at higher loads. Performance parameters such as brake thermal efficiency (elevated by 8.98%) and brake-specific fuel consumption (diminished by 25.54%) have been significantly analyzed and compared to diesel. While the emissions (such as hydrocarbons and carbon monoxide) were found to be reduced by 22.87% and 25.67%, respectively, for B30DMC10, the nitrous oxide and smoke opacity were also reduced by 9.57% and 12.4%, respectively, for the B30GNP60DMC10 sample. Hence, a combining operation of graphene nanoplatelets and dimethyl carbonate additives in a biodiesel blend presented great potential in terms of performance improvement and reduction in emission parameters in diesel engine.

1. Introduction

Accessibility and effective energy production are the primary concerns influencing every nation's financial circumstances. Compression ignition (CI) engines stand out among energy transformation devices due to specific outstanding capabilities, such as greater thermal efficiency, reduced brake fuel consumption, utilization of lean air-fuel ratios, stability, and lower operating costs in agricultural and road transportation [1–3]. However, due to the shortage of fossil fuel

INVESTIGATIONAL STUDY ON INFLUENCING PARAMETERS FOR FLEXURAL STRENGTH AND HARDNESS OF NITINOL-BASED ALUMINUM MATRIX COMPOSITES

Javvadi Eswara Manikanta[1*], Naveen Kumar Gurajala[2], Chitrada Prasad[3], D. Santha Rao[4], Adina Srinivasa Vara Prasad[5], B.S.S. Phani Sankar[6]

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Abstract

Growing demand for advanced materials with outstanding properties focused on the development of various metal matrix composites in recent years. The practical complexities and obstacles encountered during their development affect the enhancement of desired properties. The analysis of parameters influencing the enhancement and decrement of desired properties can provide insight into understanding the phenomena. In this study, a metal matrix composite is fabricated through a stirring process by using aluminum (Al),and nickel-titanium (Ni-Ti) as base material and reinforcing elements. The number of experiments required to perform on the castings is minimized by designing a central composite rotatable design with a four-factors such asstirring speed, casting temperature, casting time, the weight fraction of reinforcement material,and five levels.The influence of factors on the properties such as flexural strength and hardness are studied through experiments. The phenomena forthe enhancement and decrement due to porosity, coagulation, and bulk deposition of Ni-Ti are discussed by analysing the resultsand characterization of the microstructure.

Keywords: Flexural strength, hardness, aluminium composites, Ni-Ti alloys, design of experiments

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An Experimental and CFD Analysis of Parallel and Counter Flow Heat Exchanger by Using Double Tube Helical Coil

N V S G Sasikiran[1] | S Bhanu Kishore[2] | G Venkatesh[3] | N Uma Nageswara Rao[4] | S Sai Ram[5]
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ABSTRACT

A helical coil heat exchangers are mostly used in industrial applications such as chemical and food industries, power production, electronics, environmental engineering, production industry, air conditioning, waste heat recovery units etc. over the straight type and shell type heat exchangers due to its compact structure are larger heat transfer area and higher heat transfer capability etc. In the study of double tube helical coil heat exchanger has been modeled for fluid flow and an attempt has been made to arrangement of both parallel and counter flow and we simulate the double tube helical coil in ANSYS fluent flow called as CFD analysis.

Heat transfer characteristics for different fluid flow rates in the outer pipe and inner pipe. Copper was chosen as the as metal for the construction of the helical tube as both inner and outer pipe. The fluid flowing in the tube was taken as water. The total heat transfer rate from the wall of the tube were calculated and plotted using ANSYS FLUENT 2023.

KEYWORDS: *Heat Exchanger, Heat Transfer, Helical Coil, and CFD.*

I. INTRODUCTION

A heat exchanger is used to transfer thermal energy between two or more fluids, and a variety of heat exchangers are generally used in different types of engineering applications. The purpose of constructing a heat exchanger is to get an effective method of heat transfer from one fluid to another fluid. The tube in tube type heat exchanger have one pipe placed inside another pipe concentrically which has a greater diameter. It can be arranged in many series and parallel configurations to meet the different heat transfer requirements. It is found that the heat exchange in helical-coil tubes is greater as compared to straight tubes due to their shape. Helical coils offer advantages due to their compactness and increased heat transfer coefficient. The change in heat transfer coefficients are a consequence of the curvature of the coil, which has the centrifugal forces to act on the moving fluid, resulting in the occurrence of secondary flow. Due to the curvature effect, the fluid streams on the outer side of the pipe move faster than the fluid streams on the inner side of the pipe.

Helical tubes are widely used in various heat transfer processes, like heat exchangers. It is a fact that the heat exchange characteristics of a helical-coil type heat exchanger are much better than that of a straight tube because of higher turbulence and the occurrence of the secondary flow in planes is normal to the flow inside the helical tube. Helical tubes are efficient in heat transfer enhancement, where the uniform curvature of a spiral structure is not possible in pipes installation in heat exchangers. Due to their compact structure, high heat transfer coefficient, and effectiveness, these heat exchangers find wide applications in such fields as power generation, nuclear industry, process plants, heat recoverysystems, refrigeration, and the food industry. Helical coils are used for various processes, such as heat exchangers, because they can accommodate a large heat transfer area in a small space, with a high heat transfer coefficient. The centrifugal forces are acting on the moving fluid due to the curvature of the tube, which results in the development. Several

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An Experimental Study of 3D FDM Printing toImprove Mechanical Properties Using ABS Material

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ABSTRACT

The use of additive manufacturing (AM) applications has grown in popularity among both enthusiasts and academics. Recent years have seen AM develop from an RP technique to one used in the production of finished goods. Understanding the qualities and characteristics of the materials used in 3D printers is crucial as the shift from RP to manufacturing becomes an increasingly recognized practice. In order to assess the level of anisotropy in 3D printed materials, this study describes the technique and results of mechanical characterization of acrylonitrile butadiene styrene (ABS) and 3D printed components. Different raster values ([+45/40], [+30/35] were used to print the samples.

KEYWORDS:*Acrylonitrile Butadiene Styrene (ABS), Additive Manufacturing, 3D Printing.*

I. INTRODUCTION

FDM (Fused Deposition Modelling) is a popular 3D printing technology that uses a process of additive manufacturing to create three-dimensional objects from a thermoplastic material.

In an FDM machine, a spool of thermoplastic filament is fed into the printer through a heated nozzle or extruder. The nozzle is heated to a temperature at which the filament melts and becomes a viscous liquid. The nozzle then moves in a precise pattern over a build platform, depositing the melted material layer by layer to create the desired shape of the object.

As the melted filament is extruded onto the build platform, it quickly cools and solidifies, forming a strong bond between the layers. This layer-by-layer deposition process continues until the object is complete.

FDM machines can produce objects with a wide range of geometries and sizes, making it a versatile and popular 3D printing technology. The resolution and quality of the printed object depend on several factors, including the diameter of the nozzle, the layer height, the printing speed, and the material properties.

Overall, FDM machines are an important tool for modern manufacturing, allowing for the rapid production of complex, high-quality parts and products.

ABS (Acrylonitrile Butadiene Styrene) is a common thermoplastic polymer used in a variety of applications due to its excellent mechanical and thermal properties. FDM (Fused Deposition Modelling) is a 3D printing technology that uses a heated nozzle to extrude molten thermoplastic material layer by layer to create 3D objects.

To test the material properties of ABS, you can use a variety of techniques including tensile testing, impact testing, and hardness testing. Here is a general overview of each of these tests:

Tensile Testing: This is a common test used to determine the mechanical properties of materials, such as tensile strength, yield strength, and elongation at break. To perform a tensile test on an ABS specimen, the specimen is clamped between two grips and a controlled load is applied to the specimen until it breaks. The load and elongation data are recorded during the test, and from this data, the material properties can be calculated.

Bending test is a type of mechanical test used to determine the behaviour of a material when subjected to bending loads. The test involves applying a force to a sample of the material, usually in a three-point or four-point bending configuration, and measuring the resulting

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ANISOTROPIC STRUCTURAL EVALUATION OF FUSED DEPOSITION MODELING PRINTED PET-G SPECIMENS FOR MECHANICAL APPLICATIONS

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ABSTRACT

Additive manufacturing(AM) is a sustainable and innovative manufacturing process. It manufactures theobjects by depositing material layer by layer to get the finished product. Fused deposition modeling (FDM) technology is widely used in additive manufacturing (3D printing),has revolutionized manufacturing technology and Polyethylene terephthalate glycol (PET-G) has been recently used material for 3D printing. However, still, obstacles to additive manufacturing technologies have impeded their future applicability in engineering domains. It was discovered as a material anisotropy phenomenon. Thisstudy focuses on additively built items with different infill variations and how the printing factors influence mechanical properties. We use the present 3D printing methodology to print the part with different infill variations (+20 and -20). After printing, the specimens are tested on the testing machine to observe the tensile and flexuralproperties of the printed PET-G specimens.

KEYWORDS: *Additive manufacturing, Fused deposition modeling (FDM), 3D printing, Polyethylene terephthalate glycol (PET-G), Material anisotropy, Infill variations*

I. INTRODUCTION

Additive manufacturing is a novel technology that enables the rapid fabrication of physical models directly from three-dimensional computer-aided design(CAD) data without any conventional tooling or programming requirements. It gives greater design flexibility and allows companies to turn first and effective design ideas into successful prototypes and end products rapidly and efficiently. The first additive manufacturing process appeared in 1986 with the introduction of stereo lithography technology. In the early 1990s, other technologies were commercialized including fused deposition modeling (FDM), laminated object manufacturing (LOM), and selective laser sintering (SLS). Stratasys introduced fused deposition modeling (FDM) technology in 1991, which has since become the most widely and commonly used AM process, which builds parts in a layer-by-layer manner by extruding semi-molten thermoplastic materials through a liquefier nozzle onto a platform. Recently, several entry-level and open-source FDM-type machines have appeared in the market, which can process a variety of thermoplastic materials. These low-cost AM machines not only serve as a means of learning and communications in education but also offer applications in design verification and functional testing of engineering parts. Polyethylene terephthalate glycol-modified, more commonly known as PET-G, is a material that is largely used in industrial applications, including advertising displays and electronic insulators. It also has several medical applications, such as implants, dental aligners, and packaging for medical elements. In the 3D printing world, PET-G is typically used in models that need good shock resistance or some flexibility, like snap-to-fit components. It is also a go-to material for food-related prints, as it doesn't deteriorate with water, isn't toxic, and is FDA-approved. As one of the most popular 3D printing filaments, it's important to know your way around PET-G.

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The effect of graphene nanoplatelets on Physico-chemical properties of *Sterculia foetida* biodiesel-diesel fuel blends

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ABSTRACT

Biodiesel is well known as an alternative to the CI engines owing to being renewable, environmentally friendly, biodegradable, and non-toxic with fewer emissions. Biodiesel is prepared from several types of vegetable oils, and the current study uses *Sterculia foetida* oil (non-edible oil). The major problem with using biodiesel blends in CI engines is emissions that rely on physicochemical properties. Hence, the current study is to evaluate the physicochemical properties of biodiesel-diesel blends with the addition of graphene nanoplatelets at different dosage levels of 25, 50, and 75 ppm. The prepared samples are expressed as SFOME20, SFOME20GNPs25, SFOME20GNPs50, and SFOME20GNPs75. The physicochemical properties are measured for prepared samples according to the ASTM standards. The inclusion of nanoplatelets improves the fuel blend properties such as density, viscosity, cetane index, flash point, fire point, cloud, and pour point. In contrast, the calorific value is a little decreased.
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1. Introduction

Many sectors use petroleum products for economic growth in every country, more particularly the industrial and transport sectors [1,2]. The global use of these products enhances the costs due to their higher demand. These problems urge researchers to find alternative fuels from sustainable energy resources. Since a big draught is going to arrive as these petroleum products are depleting in a few decades [3,4]. Apart from this, the hazardous pollutants released from the use of these products could cause major health issues. Concerning the above problems, there is a need for renewable sources like biodiesel since they possess non-toxic, biodegradable, and environmentally friendly and which also aids in creating environmental neutralization [5,6]. Biodiesel can be prepared from edible/non-edible feedstocks. Most of the research work is associated with non-edible oils due to the high cost and no competence of in human food products [2]. Biodiesel contains extra oxygen atoms, which aids in improving combustion properties. Out of the many benefits of biodiesel, there are a few drawbacks such as high viscosity, lower calorific value, and poor low-temperature properties (Cloud point and pour point). Researchers developed a technique to enhance the fuel properties and overall performance characteristics of the engine by using fuel additives to address the above problems. The alcohol additives (such as *n*-butanol, heptanol, ethanol, diethyl ether, etc.) were used last decade and resulted in improved combustion that reduced emission characteristics. But, the addition of alcohol-based biodiesel was not successful due to the formation of lean mixtures, lower calorific value, and low lubrication properties, which causes reduced performance and engine deterioration problems [7–9]. As a result, researchers have investigated the possibilities of micro

Abbreviations: ASME, American Society for Testing and Materials; SFOME, Sterculia foetida oil methyl esters; SFOME20GNPs25, Sterculia foetida oil methyl esters 20(%) + Diesel 80(%) + Graphene nanoplatelets 25ppm; SFOME20GNPs50, Sterculia foetida oil methyl esters 20(%) + Diesel 80(%) + Graphene nanoplatelets 50ppm; SFOME20GNPs75, Sterculia foetida oil methyl esters 20(%) + Diesel 80(%) + Graphene nanoplatelets 75ppm; FESEM, Field emission scanning electron microscopy; HRTEM, High-resolutiontransmission electron microscopy; FTIR, Fourier transform infrared; XRD, X-ray diffraction.

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Research Article

Influence of Dimethyl Carbonate and Dispersant Added Graphene Nanoplatelets in Diesel-Biodiesel Blends: Combustion, Performance, and Emission Characteristics of Diesel Engine

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The aim of the current study is to investigate the combustion, performance, and emission characteristics of a diesel engine adopting graphene nanoplatelets and 10% *v/v* dimethyl carbonate as fuel additives in a 30% biodiesel and 70% diesel blend. The novel findings are documented in the subsequent sections. The surface modification of graphene nanoplatelets using a lipophilic surfactant was used which gave highest stability in fuel samples which is a main distinctive in this research work. Nanofuels were prepared using 30, 60, and 90 ppm concentrations of nanoparticles through ultrasonication. The behaviour of graphene nanoplatelet was characterized using field emission scanning gun-electron microscopy, high-resolution transmission electron microscopy, Fourier transform infrared, and X-ray diffraction. A diesel engine having uniform speed of 1500 rpm was used for the experiment at various load conditions to assess the engine operating parameters for all the prepared samples, including baseline diesel. It was observed that the combustion characteristics were found to be greatly enhanced, such as cylinder pressure and heat release rate, increased by about 15.45% and 9.63%, respectively, for B30GNP60DMC10 sample than diesel at higher loads. Performance parameters such as brake thermal efficiency (elevated by 8.98%) and brake-specific fuel consumption (diminished by 25.54%) have been significantly analyzed and compared to diesel. While the emissions (such as hydrocarbons and carbon monoxide) were found to be reduced by 22.87% and 25.67%, respectively, for B30DMC10, the nitrous oxide and smoke opacity were also reduced by 9.57% and 12.4%, respectively, for the B30GNP60DMC10 sample. Hence, a combining operation of graphene nanoplatelets and dimethyl carbonate additives in a biodiesel blend presented great potential in terms of performance improvement and reduction in emission parameters in diesel engine.

1. Introduction

Accessibility and effective energy production are the primary concerns influencing every nation's financial circumstances. Compression ignition (CI) engines stand out among energy transformation devices due to specific outstanding capabilities, such as greater thermal efficiency, reduced brake fuel consumption, utilization of lean air-fuel ratios, stability, and lower operating costs in agricultural and road transportation [1–3]. However, due to the shortage of fossil fuel

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DESIGN AND EXPERIMENTAL INVESTIGATION OF PCM BASED ELECTRICAL VEHICLE BATTERY COOLING CHAMBER

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ABSTRACT

Electric vehicles are a rapidly growing segment of the automotive industry, and for good reason. An electric vehicle offers several benefits over gasoline-powered vehicles, including reduced emissions, lower operating costs, and a quieter, smoother ride. However, some factors limit the electrical vehicles, especially their performance and safety of batteries. So battery safety plays a key role in electrical vehicles. An electric bike battery cooling chamber is a compartment designed to regulate the temperature of the battery in an electric bike. It uses a cooling mechanism to prevent the battery from overheating and sustaining damage, which can lead to reduced performance and a shorter lifespan. The cooling chamber consists of a closed compartment with ventilation channels and cooling fins, which help dissipate heat away from the battery. Here we use a phase-change material, which is paraffin wax that can transfer its phase by absorbing heat and help to maintain the temperature. In this analysis, we are using the phase-change material paraffin wax in the chamber with the battery, and here we conduct experiments at various working temperatures. including room temperature 34°C Testing results show that PCM material can control peak temperatures under 65°C. The results of this analysis show that PCM cooling in battery thermal management has promising advantages over traditional air cooling.

KEYWORDS: *Battery Thermal Management System, Phase Change Material, Paraffin Wax*

I. INTRODUCTION

The growth of electric vehicles (EVs) has been accelerating rapidly in recent years, driven by a combination of factors such as environmental concerns, government incentives, and advancements in technology. However, with the widespread adoption of Electric vehicles comes the need to ensure their safety, particularly when it comes to the batteries that power these vehicles.

The batteries used in Electrical Vehicles are typically large and complex, composed of hundreds or thousands of individual cells that store and release energy. So due to the over use of the battery there have been some incidents in which EV batteries have caught fire or exploded, raising concerns about their safety.

To avoid these adverse impacts of high-temperature conditions, battery systems designed for vehicle applications typically employ convective thermal management in the form of air or liquid cooling. Thermal management system designs can vary widely in complexity and cost, To make it simple and less cost,the management system might use a small fan to circulate ambient air from the environment through the battery chamber. This approach is fairly simple and inexpensive to implement, but it might not manage heat effectively enough to permit high-rate battery use in all conditions. Battery cooling is an essential aspect of battery management, especially in electric vehicles and other high-power applications. Excessive heat can cause batteries to degrade rapidly, reducing their performance and lifespan. Therefore, a cooling chamber is necessary to maintain the battery's temperature within an optimal range.

The battery cooling chamber typically consists of a heat exchanger, a coolant, and a pump. The heat exchanger is responsible for removing heat from the battery and transferring it to the coolant. The

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Evaluation of mechanical properties of aluminium alloy (AA 6082) reinforced with Rice husk ash (RHA) and Boron carbide (B_4C) hybrid metal matrix composites using stir casting method

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Impact Strength
Flexural Strength

ABSTRACT

Aluminum alloys are commonly employed in shipbuilding and automotive manufacturing units. The mechanical properties of alloys, such as strength and hardness, can be improved by adding reinforcement to the matrix material. Stir casting is an improved method for uniform dispersion of particles over conventional casting methods. Therefore, an effort is made to fabricate aluminium alloy (AA 6082) composites with different ratios of hybrid reinforcement of Rice Husk Ash (RHA) and Boron Carbide (B4C) reinforcements. The mechanical properties of composites such as tensile strength, hardness, flexural strength, and impact strength were evaluated. The microstructural properties of composites were evaluated using a scanning electron microscope to determine the dispersion of particles in the matrix material. It is found that tensile strength, hardness were improved by 20% as well as the uniform distribution of reinforcement particles in composites.
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1. Introduction

In today's environment, maximum optimization is sought in every field and every technology. The environment is greatly impacted in the pursuit of these developments. As a result, specific significant progress in the domain of materials to minimize pollution has been a development in low-cost MMCs reinforced with eco-friendly materials.

AA 6082 is a precipitation hardened aluminium alloy with the main alloying components of silicon and magnesium. It has good weldability and great mechanical properties. In the production of steel, the alloy is utilized as a reducing agent. When compared to unreinforced alloys, particles-reinforced aluminium alloys have better mechanical properties [1,4]. Aluminum MMCs have a vast scope of applications because of their high strength-to-wear ratio, stiffness, wear resistance, light weight, strong and enhanced electrical & thermal properties, in the field of organizations such as military, aerospace and automotive. The most commonly utilised materials for reinforcing aluminum are ceramic particles for example Al_2O_3, SiC, RHA, and fly ash could be used as substitutes for SiC and Al_2O_3 because they are readily available in large quantities.

RHA with B_4C has a high strength, outstanding high hardness, great wear resistance, high thermal conductivity, low coefficient of friction, and exceptional machinability. RHA is a type of agricultural scrap that accounts for 20% of the world's rice production, which totals 759.6 million tons each year. Wherever this RHA is discarded, it harms the ecosystem, posing an environmental concern. As a result, the scholar is able to make the most of the agricultural scrap. When the husk is burned at a low temperature under 800 °C, amorphous silica-rich ash is produced, which can be used to build low-density composites with good temperature resistance and hardness [4,13].

B_4C is an exclusively hard substances, which is manufactured in quantities of tons. The reaction created from carbon with B_2O_3 in an electric arc furnace results in B_4C powder via gas phase reactions or carbon thermal reduction. B_4C powders are typically milled and refined for use in the removal of metallic contaminants. B_4C is used in bullet proof vests, tank armour and various industrial applications [11].

Stir casting is an often used commercial technique for fabricating aluminum-based composites. The preheated reinforcement

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Effect of nanoparticle on mechanical properties of activated tungsten gas welding of austenite stainless steel 316L and optimization of process parameters

Santha Rao Dakarapu, Praveena Chakravarthy Maddili and Krishna Mohan Revu

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Abstract

Austenite stainless steel 316L was developed to improve corrosion resistance and is widely used in automobile components, thermal power plants, and pressure vessels due to their superior toughness and intergranular corrosion resistance. The austenite stainless steel 316L has a low carbon content of 0.03%, which helps in minimizing harmful carbide precipitation during welding. The joint strength of welded joints is poor unless proper care is taken. As a result, an attempt was made to use an activated Tungsten Inert Gas (A-TIG) welding procedure to improve the joint strength of butt welded joints of austenitic stainless steel 316L. The process parameters such as current, the volume of flow, and filler diameter were chosen in the study and generated an L_9 design matrix using MINI Tab software. The welded joints were prepared as per the design matrix using the activated flux of aluminum oxide nano powder as per the combination of process parameters. The mechanical tests such as tensile strength, hardness, and impact strength were evaluated and microstructural evaluation of welded joints was also assessed. The input parameters were optimized for better tensile strength of joints using Taguchi S/N analysis. It is found from the optimization that the highest ultimate tensile strength of 690.40 MPa was obtained at a current of 90 A, shielding gas flow of 13 l min^{-1}, and filler material diameter of 2.5 mm. The model was also validated by conducting experiments.

Keywords: Activated flux; Austenite stainless steel 316L; Design matrix; S/N ratio; Tensile strength; Tungsten inert gas welding

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Evaluation of mechanical properties for Composite Materials with Hemp and Flax Fibers Using Vacuum Moulding

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ABSTRACT

In this project we evaluate the mechanical properties of composite materials made with hemp and flax fibers using vacuum moulding. The aim of the project is to investigate the potential of these natural fibers as a substitute for synthetic fibers in composite materials. The study involves the fabrication of composite samples using vacuum moulding with different fiber ratios and matrix materials. The mechanical properties of the composite samples, including tensile strength, flexural strength, Hardness and impact strength, are then evaluated using standard testing methods. And further research is needed to optimize the mechanical properties of these materials. Their adaptability to different situations and desirable properties attracted many industries. In the automotive industry the demand for lighter components is increasing day by day. They are often having to low densities, resulting in high stiffness, low weight and high strength to weight ratios when compared to modern engineering materials In the purpose of project Natural Fiber are hemp and Flax Materials are epoxy and hardener are mixed to obtain rectangle shape and check Mechanical properties. In this project we have use vacuum infusion process with the help of high pressurized vacuum cleaner. The combination of Hemp fibre and Flax fibre in composites has been found to improve the overall mechanical properties. The use of Hemp fibre and Flax fibre in composites has the potential to contribute to the development of eco-friendly and sustainable materials for a wide range of application.

Keywords: *Hemp fiber mat, flax fiber mat, epoxy and hardener, vacuum infusion process.*

I. INTRODUCTION

The epoxy based composite materials have good strength and specific properties. In this study, Composite materials are widely used in various industries due to their unique combination of mechanical.To obtain improved mechanical properties such as tensile, hardness, flexural and impact. Natural fibres are obtained from plants, animals and minerals. Some examples are cotton, jute, silk,
woollen, coconut, bones, sisal, hemp, abaca, banana leaf, bamboo, wheat straw and other natural materials.
Now a days Natural composite materials have high demand in society, because of to avoid the plastic and replacing in that place using natural composite materials. It is used many sector like agricultural, automotive industry, cars, bike, aero plane, domestic products like doors, roofs and etc.

II. LITERATURE REVIEW

Aswin shahzad 2019 A number of hemp fiber surface treatments, used to improve the fiber/matrix interfacial bonding, have resulted in considerable improvements in the composites mechanical properties.

Daniel ramarez 2018 The role of über-matrix compatibility in vacuum processed natural fiber/epoxy bio composites

Antti pasila, vikkt research ftd. 2014 A new cost effective method of fabricating strong plywood type composites from strips of hemp übers and flax fiber to improve mechanical properties.

Aytac Goren, cesim atas 2010 An in-house Vacuum Assisted Resin and hardener Infusion Molding (VARIM) setup has been developed for manufacturing of matrix composites.

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Evaluation of Mechanical properties of Sugarcane Bagasse Ash Reinforced Polyester Matrix Composites

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ABSTRACT

In the present scenario one of the emergingtechnology is that creating and developing the composite materials. The natural Composite reinforced polymer matrix composites have more applicable because of their biodegradable ,light weight, less expensive sources and easy processing. This project Work was shown and examined the behaviour of sugarcane bagasse ash reinforced with polymer matrix. The bagasse ash was reinforced to Polyester Resin with suitable hardener by mechanical stirring process. The test specimens were prepared at different percentage of compositions at 0%,10%,and 15% by weight of bagasse ash with the polyester Resin. The specimens were prepared by hand layup process and specimens was tested as per ASTM standard dimensions and observe the various Mechanical properties by conducting the tests of tensile, flexural, Impact, Hardness and Scanning Electron Microscopy(SEM).

KEYWORDS: *Natural fiber, polymer matrix, bagasse ash, tensile, compressive, Impact, SEM Analysis.*

I. INTRODUCTION

From the past decades many researchers are showing interests in developing the composites and improvements in existing ones, Because of various potential applications such as aeronautics, automobiles, marines, military and other domains. Polymer composites are most popular due to their superior properties like light weight, easy formation on processing ,less expensive, high strength to weight ratio [1]. Composites are defined as the, two dissimilar materials with different properties mixing into each other to form one material with improved properties. The composite consists of two or more composition of materials. One which is in higher quantity is called as matrix and another which is in lesser quantity is called as reinforcement [2]. The improvement of the mechanical properties of composite material is depends upon the percentage of weight added, type of reinforced material quantity distribution and bonding between the materials [3].Other than the thermoplastic polymers epoxy resins are thoroughly used due to their good mechanical, thermal properties , high resistance to corrosion , processing under variety of situations [4].

Polymer composites can made with two different ways i.e., synthetic fibres (carbon fibres, glass fibres, basalt etc..) and natural fibres (bagasse fibre/ bagasse ash, coal powder, fly ash etc..).Synthetic fibres arenonbiodegradable and costly. Natural fibres are Biodegradable, easily available, good bonding capability, high potential. As mentioned above the natural fibre i.e., bagasse is the rest of content after squeezing water content from the sugarcane. In sugar industry produces 30% of bagasse produces out of their total crushing the sugarcane [5]. The use of natural and sustainable materials, such as bagasse ash, in the manufacturing of composite materials is becoming increasingly popular. Bagasse ash is a by-product of sugarcane production and is usually disposed of in landfills, leading to environmental pollution. However, it has been found to have potential as a reinforcement material in composite materials due to its high silicon content, low cost, and biodegradability. SCBA properties are depends upon the temperature range and time duration of burning . These parameters are may effects the macroscopic morphology and physical properties like surface area, specific gravity, fineness , colour. SCBA particles shapes are spherical, prismatic, fibrous and irregular. The manufacturing process for composite materials involves several steps, including mixing the components, pouring the mixture into a mold, and curing the composite material. The curing process involves the hardening of the matrix material due to the

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Experimental Investigation and Performance Parameter Analysis of Four Stroke Single Cylinder Diesel Engine Fueledwith Cotton Seed Oil and Neem Oil as Alternative fuels

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ABSTRACT

Biodiesel is a non-toxic, biodegradable, and renewable alternative fuel that can be used in diesel engines with no modification. It usually produces fewer air- pollutants than petroleum-based diesel. Biodiesel is a fatty acid alkyl ester, which can be derived from any vegetable oil by transesterification (alcoholysis). The main objective of this paper is the suitability of biodiesel blend among all blends of cottonseed oil and neem oil as an alternative fuel for diesel engines and to estimate the engine performance. The performance parameters evaluated were brake power, indicated power, specific fuel consumption, brake thermal efficiency, indicated thermal efficiency, and mechanical efficiency.

The results of the experimental investigation with C5, C10, C15, C20, C25(cottonseed biodiesel blends), N5, N10, N15, N20, N25(neem biodiesel blends) biodiesel blends were compared with diesel. The results indicated that the performance of C20 was better compared to diesel and neem blends. C20 blend was improved1.9% mechanical efficiency and 1.37% break thermal efficiency compared to diesel. The performance of N20also recorded as mechanical efficiency of 71.18% which is higher among all neem blends and diesel as well. N20 blend recorded as minimum fuel consumption among all neem blends.

KEYWORDS: *Bio-diesel, Cottonseed oil, Neem oil, Transesterification, Mechanical efficiency*

I. INTRODUCTION

Many experiments have clearly revealed that the widely applied and convenient method for reduction of viscosity and density of vegetable oils is transesterification. In spite of transesterification treatment, viscosity and density of biodiesel is still higher than that of diesel fuel. The biodiesels used in the experiments performed by these investigators were produced from different vegetable oils such as cottonseed, sunflower, rapeseed, soybean, rubber seed, etc.

Conventional energy sources such as oil, coal and natural gas have limited reserves that are expected not to lose for an extended period. Diesel engines are the major source of power generation and transportation hence diesel is being used extensively, but due to the gradual impact of environmental pollution there is an urgent need for suitable alternate fuels for use in diesel engine without any modification. Its help on reducing a country's reliance on crude oil imports its supportive characteristic on agriculture by providing a new market for domestic crops, its effective lubricating property that eliminates the need of any lubricate additive and its wide acceptance by vehicle manufacturers can be listed as the most important advantages of biodiesel fuel. There are more than 350 oil bearing crops identified, among which only Jatropha, sunflower, Soya bean, cottonseed, rapeseed, palm oil and peanut oil are considered as potential alternative fuels for diesel engines.

Governments across the world are feeding huge money and resources into the development of this sector in an attempt to reduce their dependency on oil. The major economic factor to consider for input costs of biodiesel production is the feedstock (price of seed, seed collection and oil extraction, transport of seed and oil), which is about 75–80% of the total

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Experimental Analysis and Investigation of Reduction of Corrosion Rate on Copper Coils

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ABSTRACT

The main objective of the project is to make the copper to last for a bit longer than the proposed time. Generally, we have two types of coils in A/C's. They are copper and aluminum, here we choose copper over aluminum due to better thermal conductivity and tensile strength. We are trying to improve the life span of the copper by coating the phosphor bronze over copper through the Electroplating Process, The main reason of Coating Phosphor bronze over copper is for corrosion resistance. By this coating which makes it to resist corrosion as compared to the copper. And to sustain for a bit longer despite of lasting for theoretical period of time proposed by the company. The samples are undergone with SEM analysis for testing purpose. Test Procedure for corrosion test have done. Corrosion rate test results shows the best outcomes at 0.3M Concentrated Electrolytic Solution at 10.19v and the Run time for whole Electro-Plating is 60minutes with corrosion rate of 0.034563mm/year.

KEYWORDS: *Electro-Plating Process, Phosphor Bronze, Corrosion Resistance, Copper, Coating.*

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I. INTRODUCTION

Because of its superior thermal and electrical conductivity, copper is used extensively in the production of electrical goods and other appliances. Its alloying capabilities and ductility make it suitable for use in building materials, industrial machinery, and other equipment, respectively. However, due to its molecular reactivity, copper's uses have been constrained. Copper can corrode when it reacts with an inert environment, such as sea water or a moist atmosphere where the content is rich in oxygen. When prevalent in seawater, the chloride ion is extremely aggressive toward copper and causes severe corrosion. Therefore, the creation of a reliable and long-lasting anti-corrosion protective coating is essential for use in the aforementioned uses. In order to increase the durability of materials even in harsh environmental conditions, it is now possible thanks to nanoscience and nanotechnology to create strong, environmentally friendly coatings that are resistant to oxidation and corrosion [1].

Four key components that work together to produce coatings are coating material, coating procedure, coating equipment, and coating management. Together, the advancement and growth of coating process and technology are improved. Given the present intense international competition, it is difficult for the main manufacturers to figure out how to improve the coating quality of the products. The quality of the coating on the surface material will directly affects the life of the product. The external conditions needed for the coating line's production process could be guaranteed, ensuring the product's quality and boosting the facility's ability to compete globally, if the temperature of the air conditioning system could be successfully controlled. The coating's ability to prevent rust is significantly influenced by how well it adheres to metal surfaces. [2]

1.1Novelty of the current work

The present study mainly concentrates on reduction of the corrosion rate on the base metal surface **(Copper C12200)** of the material. Most of the Air coolers copper coils were made by using this particular grade **(Copper C12200)**. And the down fall of the corrosion probability on the copper metal

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EXPERIMENTAL ANALYSIS OF MECHANICAL PROPERTIES OF AA6061 COMPOSITE REINFORCED WITH TiO_2 PARTICLES USING STIR CASTING PROCESS

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ABSTRACT

This research work was investigatedabout the mechanical properties of the AA6061 (Aluminium Alloy 6061) reinforced with Titanium Dioxide particles. The composite is manufactured using the Stir casting process. The composite is casted and the specimens are made by using the conventional machining processes as per the ASTM standards to perform various mechanical tests. The percentage of reinforcement material is varied from specimen to specimen in the range of 5%, 10% and 15%. The percentage variation of the reinforcement material was resulted a change in mechanical properties of the composite material. The variation in Mechanical properties of the composite material are determined by performing various mechanical tests on the specimens. And the micro structure of the specimens were studied by using Scanning Electron Microscope (SEM).

KEYWORDS: *Al MMC, Stir casting, Al6061, TiO_2 micro particles, Composite materials*

I. INTRODUCTION

There is a tremendous demand for advanced engineering materials with high strength, light weight, and increased resistance to wear in aerospace, civil and sliding components of automobile sectors. This leads to the development of aluminium matrix composites (AMCs). Aluminium is principally reinforced with hard phases such as SiC, TiC, TiB_2 and Al_2O_3 and soft phases like graphite (Gr) and MoS_2.Aluminium metal matrix composite filled with nano particles featuring physical and mechanical properties very different from conventional metal. The micro particles can improve the base material in terms of tensile strength, compressive strength, hardness, wear resistance, damping properties, porosity, corrosion resistance and mechanical properties. The Exploitation of reinforcement of nano particles on metal matrix depends on the type of primary and secondary processing, matrix composition, size, volume fraction, morphology of reinforcement and heat treatment. Among all the investigated, nano particles reinforcement with Titanium dioxide was found to be most effective in enhancing the strength properties of Aluminum when incorporated via ingot metallurgy process. Metal matrix composites have a high application potential in automotive engineering in braking systems, piston rods, piston pins, pistons, frames, valve spring caps, brake discs, disc brake caliper, brake pads, card a shaft etc. They have also found application in military and civil aviation in the area of axle tubes, reinforcements, blade and gear box casing, turbine, fan, and compressor blades. In the aerospace industry MMCs have been applied in frames, reinforcements, aerials, joining elements etc. Al-based metal matrix composites (MMCs) are well-known for their high- specific strength, hardness, and attractive tribological properties.The silicon carbide- reinforced aluminum composites are increasingly used as substitute materials for cylinder heads, liners, pistons, and brake disks in automobile industry. The main purpose of the particulate-reinforced metal matrix composite production is to obtain materials having high-wearing resistance, light weight, and high-specific strength in order to reduce the costs of technological applications and fuel consumption

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Experimental Investigation of Deposition of ABS Parts Using Extrusion 3D Printing System

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ABSTRACT

Material extrusion 3D printing is a method that uses thermoplastic filament to build three-dimensional objects .The filament is molten and driven out of the nozzle. Input materials (thermoplastic) used is in the form of granules and pellets of plastic materials. Mica heater is used to melt the input material. Barrel screw is used to feed the input of granules materials longitudinally along the screw. Input acrylonitrile butadiene styrene (abs) plastic granules is melted by using mica heater for one barrel heater and one nozzle heater is used to acquire maximum efficiency. The deposition head is mounted on a three axis computer numerically controlled manipulator with a build volume of 100mm x 100mm x 100mm to print 3d polymer parts. Plastic pellets along with filler materials can be added through the hopper on the side of barrel. ABS, PLA plastics were printed successfully and no bonding defects were observed.

KEYWORDS: *3D Printing, ABS Pellets, Substrate and Intricate Shapes*

I. INTRODUCTION

3D printing is the process of taking a designed digital model and creating a three-dimensional physical object usually by adding material. Material is successively built up layer by layer to form a 3D object. In this project an open source extruder based 3D printing system is designed and made to work with almost any type and form of plastic. The main objective is to reduce cost of input material and to provide a capability of producing particle reinforced polymer composites. This 3D printing machine uses plastic particles to Create an object by heating those plastic granules The molten plastic is ejected by the nozzle which is 3 mm diameter. The material is provided from the hooper. The extruder pushes down the molten plastic, and the heaters are provided to the barrel. To 3D print an object, the use 3D modeling software such as Autodesk Inventor, Solid works, or Google SketchUp to develop a 3D representation of the object. the model is converted into an STL file format which describes the outer surface of the object. The model can then be opened on host software such as which allows the user to rotate the object into the most structurally sound orientation for the print. a slicing software such as slices the object into layers for the printer extruder to follow. The user can also adjusts printing parameters such as print speed, layer height, and material density using this software.

II. A REVIEW OF LITERATURE WORK

Rahman et al. [1] the effect of nozzle temperature and printing speed on the mechanical properties of 3D printed ABS parts. The results showed that increasing nozzle temperature and decreasing printing speed resulted in improved tensile strength and modulus of elasticity. The authors also noted that the printing orientation of the parts had a significant impact on their mechanical properties.

Zhang et al. (2019) [2] investigated the use of carbon fiber reinforced ABS filaments for 3D printing. the addition of carbon fibers improved the mechanical properties of the printed parts, particularly their tensile strength and modulus of elasticity. that carbon fiber reinforced ABS filaments could be used for applications that require high strength and stiffness, such as automotive and aerospace industries.

Drotmen et al. [3] developed a screw extrusion based 3D printing system and compared the build capability with that of FDM process. Wide variety of materials were printed and tested for the mechanical properties and they found that strong and durable parts can be printed at less cost in

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Experimental Investigation of Deposition of PLA parts Using Extrusion 3D Printing System

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ABSTRACT

Extruder can create the polymer filaments of required diameter by varying the nozzle diameter. When assembled with a manipulator, it can lead to a system capable of depositing the input material layer by layer on the substrate. The input material (Polylactic Acid) used in the form of granules and pellets is fed into the barrel with the help of hopper attachment. The barrel is mounted with the mica heaters which makes the pellets to melt gradually. Those pellets are feed to the nozzle longitudinally through the barrel screw, which is inserted inside the barrel (GI Pipe). This arrangement makes the granules to deposit uniformly. The deposition head is attached to the z axis of the manipulator with the help of sliding blocks. The build volume of the computer numerical control manipulator is 100x100x100, which allow us to fabricate the components of range small to medium. Not only PLA parts we can also deposit the polymers like Acrylonitrile Butadiene Styrene (ABS), Polyethylene Terephthalate (PET) and some other polymers without any bonding defects.

KEYWORDS: *Polymer filaments, Polylactic acid pellets, Build volume, Mica heaters.*

I. INTRODUCTION

3D printing is the technique introduced to make the intricate components with 90% utilization of the material. Here digital inputs of the component to be deposited are given by the universal G- code sender (UGS). Fused deposition modelling (FDM) is the most commonly used technique in additive manufacturing to deposit thermo plastics.

In this FDM process input material is feed into the barrel in the form of continuous wire. This wire feeding system is expensive and not suitable to enhance the properties of the final object, as there is no provision of adding foreign material to the input material and it is difficult to feed number of polymers in continuous wire form.

In this project we go through the extrusion based 3D printing system, which help us to deposit the multiple polymers and we have the provision to add reinforcement to improve the quality of the product. The main objective of this project is to reduce the cost of people and enhance the demand of the polymers made with extrusion based deposition.

II. A REVIEW OF LITERATURE WORK

Geo raju et al. [1] developed a die design for plastic extrusion process. And determining the optimal process parameter settings critically influences productivity, quality and cost of production in the plastic related industries. They mainly focus on mathematical model, taguchi technique, artificial neural networks (ANN), fuzzy logic, genetic algorithms (GA), non linear modelling and response surface methodology.

Wu chung su et al. [2] authors said about the discrete-time vss temperature control for a plastic extrusion process with water cooled systems. They made no attempt for other cooling system except water cooling system.

T Prabhu et al. [3] author try to increase the rapid prototyping technology and try to develop the the low cost 3D printer for society. And focused on the overview of the various components of a 3D printer, including the extruder, the build platform, the motors and control systems, and the software used to generate and control the printing process.

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Extrusion Based 3D Printing System for the Deposition of Polymers

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ABSTRACT

Plastic filament extruder produces plastic filaments of specified diameter by using corresponding nozzles. Inputmaterials (thermoplastics) used is in the form of granules and pellets and it can be of waste plastic materials. Mica bandheater is used to melt the input material. Barrel screw is used to feed the input raw materials longitudinally along the screw.Screw consist of three zones namely feed, melt, and transition zone. One barrel heater and one nozzle heater is used to acquire maximum efficiency. Nozzle is used to extrude the filament at the diameter of 3mm. The deposition head is mounted on a three axis computer numerically controlled manipulator with a build volume of 100mm X 100mm X 100mm to print 3D polymer parts. Plastic pellets along with filler materials can be added through the hopper on the side of barrel. ABS, PLA plastics were printed successfully and no bonding defects were observed.

KEYWORDS: *Extrusion Based 3D printing, plastic pellets, deposition, build volume, ABS, PLA pellets*

I. INTRODUCTION

3D printing is a process used to produce complex three dimensional partsfrom a CAD model. Fused deposition modelling (FDM) is a generally used 3D printing process for polymer parts. FDMworks on the principle of additive manufacturing, where the parts are produced in layer by layer fashion. FDM uses the input material in the form of wire filament. Wire filaments are costly and the feeding system requires them in the beat quality. Various plasticfilaments used in FDM are Acrylonitrile ButadieneStyrene (ABS), Polylactic acid (PLA), Poly carbonate(PC), poly amide (PA), polystyrene (PS),polyethylene (PE) etc. Many of the researchers investigated the FDM process and improvements in the area of printing multiple materials is of prime focus. Printing two different plastics together requires a costly FDM system and parts built are like functionally graded materials but not composites. In this project an open source extruder based 3D printing system is designed and made to work with almost any type and form of plastic. The main objective is to reduce cost of input material and to provide a capability of producing particle reinforced polymer composites.

II. LITERATURE REVIEW

Harimalairajan et al. [1] developed a plastic filament extruder to produce filaments out of waste plastic material to reduce the cost of commercially available filaments in the market. Extruder was capable of producing consistent filaments of 3 mm diameter. Authors made no attempt to fabricate a 3D printing system using the developed deposition head.

Drotmen et al. [2] developed a screw extrusion based 3D printing system and compared the build capability with that of FDM process. Wide variety of materials were printed and tested for the mechanical properties and they found that strong and durable parts can be printed at less cost in comparison with the FDM process.

M H Wankade et al. [3] made plastic filament extruder for 3D printing and made no attempt to use the developed head for an extrusion based printing system. They only studied the possibility of making low cost filaments for FDM machines.

F.C Eboh et al. [4] developed the use of waste polyethylene terephthalate (PET) plastics as a raw

EFFECT OF HSS AND WC DRILL BITS ON FORM AND HOLE PRECISION IN Ti-6AL-4V DRILLING OPERATIONS

Karaka VVNR Chandra Mouli[1*], Y. Ramamohan Reddy[2], G. Ramakrishna[3]

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Abstract

In many manufacturing applications, the form and hole precision of a product can directly affect its functionality. High form and hole precision are key indicators of product quality. If a product is manufactured with low precision, it can lead to defects, errors, and a reduction in overall product performance. Manufacturing with high precision can help reduce waste and improve efficiency. By minimizing errors and producing high-quality products consistently, manufacturers can increase their throughput, reduce costs, and ultimately improve their bottom line. The aim of this study is to evaluate the differences in vibrations and form that are induced by using HSS and WC drill bits to perform drilling operations on Ti-6AL-4V work material. In the current study, measurements of form error in the work piece as well as vibrations of the tool that is being used throughout the drilling process are obtained. The diameter of the drill bits that were taken is 10 millimetres. The increasing frequency and vibration amplitude both lead to an increase in the amount of form error in the work material, as well as a displacement of the hole centre and a movement of the tool position away from its centre. Form error, such as the measurement of roundness is taken into consideration.

Keywords: Drilling; Roundness; Vibrations; CMM; Form measurement

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Synthesis of SiO2 Nanoparticles using Sol-gel Method

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ABSTRACT

This study presents the synthesis of SiO_2 nanoparticles using sol-gel method. The sol-gel process is a more chemical method for the synthesis of various nanoparticles, especially metal oxide nanoparticles. Tetraethyl orthosilicate (TEOS) is used as a molecular precursor for source of silicon and water, ethanol were used as solvents. Ammonia is used as a catalyst to control hydrolysis and condensation reactions. Since the gel obtained from the hydrolysis process is wet form. It should be dried at 90°temperatures for 7 hours in a hot air oven. The silicon oxide nanoparticles were characterized using scanning electron microscopy (SEM). The SEM images confirmed that the shapes of the nano particles are spherical in shape. The SEM images showed that increasing in ammonia results in increase in the size of nano particles.

KEYWORDS: *Sol-gel method,TEOS, Stirring, Hydrolysis, Condensation, SiO_2 nanoparticles,Scanning Electron Microscopy (SEM).*

I. INTRODUCTION

Nanotechnology is rapidly growing in all the important fields of science and technology such as aerospace, medical, automobile, biotechnology. Nanotechnology deals with the materials in the nanoscale in which physical and mechanical properties of those materials are different from the original size atoms and molecules. There are several methods of producing nanoparticles such as physical and chemical methods. Metal oxide nanoparticles have wide range of applicationsin surface treatment process. The Sol-gel method is one of the bestmethod for producing ceramic nanoparticles or metal oxide nanoparticles.

Sol-gel method is the cost-effective chemical method for preparing nanoparticles in which the precursor is dissolved in the de-ionized water or alcohol. It is then converted in to gel form by stirring at constant speed and in controlled temperature. The gel is dried to remove the fluid content present in it and the dried gel is grinded to get into the powder form.The Sol-gel method can be controlled very easily by controlling the temperature.

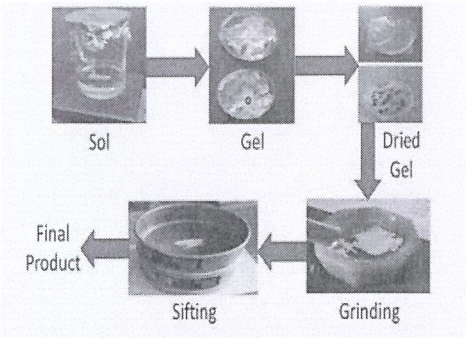

Fig 1. Schematic diagram for silica synthesis process using Sol-gel technique

The sol-gel process is carried out in three different stages. Those processes are listed below in the list.

1. Hydrolysis and condensation
2. Ageing and
3. Calcination

1. Hydrolysis:

Hydrolysis is the chemical reaction of breaking down organic molecules and condensation is the chemical reaction of building up of organic molecules. Hydrolysis and condensation are two opposite reaction and these processes result in a

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Synthesis of SiO2 Nanoparticles using Sol-gel Method

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KEYWORDS: *Sol-gel method,TEOS, Stirring, Hydrolysis, Condensation, SiO_2 nanoparticles,Scanning Electron Microscopy (SEM).*

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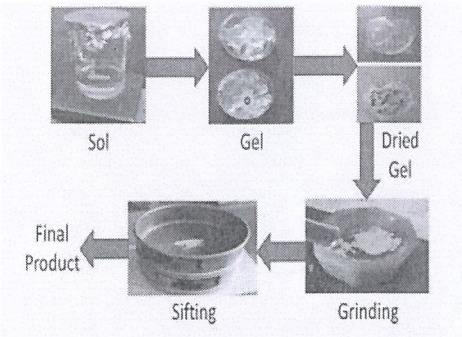

Fig 1. Schematic diagram for silica synthesis process using Sol-gel technique

The sol-gel process is carried out in three different stages. Those processes are listed below in the list.

1. Hydrolysis and condensation
2. Ageing and
3. Calcination

1. Hydrolysis:

Hydrolysis is the chemical reaction of breaking down organic molecules and condensation is the chemical reaction of building up of organic molecules. Hydrolysis and condensation are two opposite reaction and these processes result in a

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TESTING OF FUSED DEPOSITION MODELING 3D PRINTED ABS AND CLEAR POLYCARBONATE MATERIALS FOR EVALUATION OF MECHANICAL PROPERTIES

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ABSTRACT

Fused deposition modelling (FDM) thin-walled specimens of ABS and Polycarbonate were the subject of this investigation on their mechanical characteristics (FDM). This study details the process of designing, printing, measuring for geometric and dimensional correctness, subjecting specimens to tensile testing and flexural testing. The information presented here may inform future studies targeted at perfecting filament deposition and enhancing the base material. Study showed that there was a considerable thickness dependence on the FDM-produced characteristics of thin-walled components.
KEYWORDS: *3D Printing, Fused Deposition Modelling, Acronitrile Butadiene Styrene, Polycarbonate.*

I. INTRODUCTION

3D Printing is any of various processes in which material is joined or solidified under computer control to create a three-dimensional object with material being added together (such as liquid molecules or powder grains being fused together), typically layer by layer. in the 1990s, 3d printing techniques were considered suitable only for the production of functional or aesthetical prototypes and a more appropriate term was rapid prototyping. today, the precision, repeatability and material range have increased to the point that 3d printing is considered as an industrial production technology, with the name of additive manufacturing. 3d printed objects can have a very complex shape or geometry and are always produced starting from a digital 3d model or a cad file

1.1 3D PRINTING

It is any of various processes in which material is joined or solidified under computer control to create a three-dimensional object, with material being added together (such as liquid molecules or powder grains being fused together), typically layer by layer. In the 1990s, 3D printing techniques were considered suitable only for the production of functional or aesthetical prototypes and a more appropriate term was rapid prototyping. Today, the precision, repeatability and material range have increased to the point that 3D printing is considered as an industrial production technology, with the name of additive manufacturing. 3D printed objectscanhave a very complex shape or geometry and are always produced starting from a digital 3D model or a CAD file. There are many different 3D printing processes, that can be grouped into seven categories

- Vat photopolymerization
- Material jetting
- Binder jetting
- Powder bed fusion
- Material extrusion
- Directed energy deposition
- Sheet lamination

1.2 Type of 3D printers:

1. Stereolithography (SLA)
2. Digital Light Processing (DLP)
3. Fused deposition Modeling (FDM)
4. Selective Laser Sintering (SLS)

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Performance Evaluation of OFDM Using BPSK over Different Fading Channel

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Abstract:

As developing the interest for high-speed information transmission lead to follow of most capable balance procedure Named as Orthogonal Frequency Division Multiplexing (OFDM) and it is a widely utilized modulation for Fourth Generation (4G) wireless communication system for WI-FI, DVB-T, WI-MAX, LTE. This paper mostly manages how fading impacts the signal by breaking down the OFDM execution under various Channels Such as Additive White Gaussian Noise fading (AWGN), Rayleigh fading and Rician fading channels scenario by utilizing Binary Phase Shift Keying adjustment (BPSK) and also Correlation made for various modulation technique such as QPSK,16QAM., and so on with the end goal of most appropriate modulation technique for OFDM for successful, dependable transmission lastly simulation has been done between Bit Error rates (BER) and Signal to Noise Ratio (SNR)

Keywords

BPSK, OFDM, QAM, BSPK, BER, Signal-to-Noise Ratio, Rayleigh channel, Rician channel, Additive White Gaussian Noise Channel

I. Introduction

In a mobile Radio propagation, the radio channel is decided basically by its multipath nature. Multiple reflections and sometimes a LOS component of the transmitted signal arrive at the receiver via different propagation paths and, therefore, with unusual time delay and amplitudes. As an effect of this, the received signal of Narrow-Band power fluctuates dramatical way when observed as a function of space or time and frequency. In the past days of mobile systems, the communications engineer focus on the time-variability narrowband channels, which were thus studied widely by that time, transmission bandwidths were very small; therefore, flat-fading was a significant and reasonable assumption [1]. As the systems have unrolled, demand for higher transmission rates has been expanding, making the channel's time dispersion a significant issue. In modulations, information represents on to changes in frequency, phase or amplitude of a carrier signal. Multiplexing deals with sharing of users in available bandwidth (i.e., it deals with distribution of available resource).OFDM is a mix of two strategies, specifically, they are modulation and multiplexing. Within the modulation technique, the given asset bandwidth split among several modulated data sources. Standard modulation techniques such as FM, PM, AM, QPSK, QAM these are all single carrier modulation techniques, to which the sending information modulates over a single carrier. Orthogonal Frequency Division Modulation is a multicarrier modulation technique, which employs a large number of carriers, within the shelter bandwidth to deliver the information from source to destination. Each carrier may employ one of the available digital modulation techniques (BPSK, QPSK, and QAM [2].

Fading characterized as the rapid variance of signal quality in short interval of time. In general transmitted waveform across channel may experience fading due to reason such as Reflection, absorption, attenuation, dispersion time, diffraction, refraction and multiple scattering Rayleigh fading factually can be defined as the deviation of received power when there is no line of sight between transmitter and receiver[4]. For a large number of paths, the central limit theorem can be employed. Consider two Gaussian random variables with the same variance with zero mean $X \sim N(0,\sigma^2)$ and $Y \sim N(0,\sigma^2)$ whose envelop follows Rayleigh distribution given by

$$f(r) = \frac{r}{\sigma^2} exp(-\frac{r^2}{2\sigma^2}) \qquad .. (1.1)$$

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Area Reduction Exclusive OR/NOR Design Using SCDM

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Abstract

The XOR/XNOR logic gates plays a crucial job in digital circuits which are full adders, compressors, parity generators and comparators. These logic gates are taken in critical path of these systems, which considerably influenced the system characteristics. An optimized layout is desired to neglect any degradation at the output voltage, devour much less power, and feature a less wide variety of transistors to implement the circuit. Two distinct approaches of three-input exclusive-OR (XOR) feature at transistor stage with a systematic cell design methodology (SCDM) are proposed in this paper. For low power and high speed (LPHS) applications, these approaches are well desirable. The proposed designs comprises low dynamic and short-circuit power consumption and their internal nodes scatter negligible leakage power, which ends up in low average power consumption. Those designs are used to improve the overall performance, voltage ranges, and the driving functionality and decreasing the quantity of transistors in the primary structure of the designs. By using MICROWIND/DSCH 180 nm technology two different approaches of 3-input XOR/XNOR circuits are designed and simulation results are generated by the usage of HSPICE 180 nm technology. In terms of speed, power consumption and transistor count the performance of proposed circuits are better than existing circuits.

Keywords: ***SCDM, leakage power, critical path, LPHS.***

I. Introduction

Circuit realization for low power and low area has appeared as a paramount problem with the magnification of integrated circuit towards very excessive integration density and high running frequencies. Because of the paramount position performed through XOR and XNOR gate in specific circuits particularly in arithmetic circuits, optimized layout of XOR and XNOR circuit to gain low power, small size and delay is wanted. The most important challenge to design XOR/XNOR circuit is to gather complete yield output voltage swing and less variety of transistors to execute it. This paper makes use the concept of SCDM concept for the designs of 3 input XOR/XNOR gate.

[1]Based on our target the SCDM considers circuit accretion in three steps: 1) wise selection of the basic cell; 2) wise selection of the amend mechanisms; and 3) transistor sizing. It ought to be noted that BDD can be applied for EBC creation of different 3-input functions. It stands as a honest overall performance metric, exactly regarding portable electronic system targets. The incentive to use this concept is the presence of a few precise capabilities and the potential to provide a few efficient circuits that enjoy these kinds of advantages.

1) The SCDM partitions the circuit structure into a major structure and optimization-correction mechanisms. In the essential structure, it considers capabilities including the least count of transistors in critical path, pretty balanced outputs, being power ground-free, and symmetry. The mechanisms have the obligation of completing the functionality of the circuits, fending off any degradation at the output voltage, and growing the driving functionality.

2) The least wide variety of transistors in critical path will increase the chances of the circuit to have better characteristics, as experimental outcomes have proven a mean saving of 10%–50% and 27%–77% in phrases of delay and energy-delay Product (EDP), respectively.

3) The dynamic consumption optimization comes from the reality of well-balanced propagation delay. This selection is effective for programs in which the skew between arriving signals is vital for proper operation,

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An Interactive Method for Content-Based Image Retrieval based on Relevance Feedback and Multiple GLCM features

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Abstract – *The manifold increase in the use of digital media on the Internet has resulted in the increasing emphasis on the field of image search or retrieval. By ignoring visual content as a basis for image retrieval and adapting methods with text search techniques the search engines suffer inconsistency between the text words and visual content. Content-based image retrieval makes use of the representation of the visual content to identify relevant images and has attracted well-deserved attention in the last few years. CBIR combines the contents or features of images like color, texture, and edges instead of TBIR that uses keywords, labels or metadata related to an image. The earlier CBIR methods were not able to bridge the gap between high-level concepts and low-level features. This work reviews the previous works carried out in this area. An approach is presented for retrieval of images based on a combination of multiple GLCM features and relevance feedback based interactive approach. Performance evaluation of this method is done based on retrieval score and accuracy.*

Keywords: CBIR, TBIR, GLCM, Feature Extraction, Relevance Feedback.

I. Introduction

The internet has changed the way we share and gather information. One of the most remarkable effects of this is the use of images to share information, which has lead to the success of IT companies like Flickr, Imgur, Instagram, Facebook etc. As online image sharing and public journalism is growing day by day, it has become mandatory to develop better search engines so that users can retrieve large number of images on the Internet. Big search engines such as Google do the image search as a purely text-based search problem and hence the search results are unsatisfactory. CBIR also was known as Query by image content (QBIC) use image content deterministic properties of color, texture, shapes and their objects in search [1]. Implementation of CBIR using only one feature will obviously not guarantee satisfactory results [2]. To overcome this problem, multiple features are combined to implement effective search and retrieval of images. An interactive user interface will allow the user to submit an initial query and refine his search results using relevance feedback. The relevance feedback being used will combine the textual features with visual features to generate a better retrieval score. This paper is organized as follows: In section 2, the basic methods used in CBIR are presented along with the basic concepts involved in it. Section 3 reviews the main issues, research gaps and literature review of few image retrieval techniques. In section 4, the proposed methodology is presented. Section 5 shows the experimental results and comparison with other techniques. Section 6 presents the conclusion of the work and future scope of the work proposed here.

II. Background Work

Image retrieval is the method for browsing, searching and retrieving images from a large database of digital images. There have been a lot of works in image retrieval systems in the recent time [3]. These works can be categorized into two categories – text-based image retrieval (TBIR) and content-based image retrieval (CBIR).

A. Text-Based Image Retrieval

In conventional systems, text-based image retrieval systems are most commonly used. This search is based on annotation of images or metadata associated with images. The most commonly used TBIR system is Google Images. In advanced systems, the annotation is a translation from a set of image segments to a set of words in the same way as done in linguistic translation [4].Even though a text-based search-engine can retrieve images properly without understanding the content, it is not convenient for a user to give a low-level description of what image he is looking for. And for this reason, the results of TBIR systems are sometimes very irrelevant.

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Design of Rectangular to Polar Reconfigurable Cordic

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ABSTRACT

CORDIC is an acronym for Coordinate Rotation Digital Computer. The CORDIC algorithm is a repetitive calculation approach ability of emerging different basic functions with a proper shift-and-add method Used to evaluate a large amount of functions. It has been used for many years for efficient implementation of vector rotation operations in hardware. It is executed merely by table look-up, shift, and addition operations. Rotation of vectors through fixed and known angles has many applications in animations, robotics, games, computer graphics and digital signal processing. In this paper we present improved method of shifting by using an alternate scheme by increasing the no. of barrel shifters with increasing pre shifting method and Fault Tolerance in Bi Rotational CORDIC circuits higher rate of accuracy in fixed and known rotations. The improvement in the fixed angle Rotation reducing the area- and Complexity in the application. From the basic architecture of cordic an fixed angle rotation is implemented by vector rotation. the rotation of vectors uncontrolled by the circuit till all rotations are completed it will results large system gain and unpredictable angles for effective operation of known angles in this paper angle correction, Quadrant correction and gain correction is implemented, this paper also proposed the rectangular to polar cordic for reducing number of multiplication and addition, also mentioned the simulation results.

Keywords: *CORDIC, Quadrant amendment, vectoring and rotation modes.*

I. INTRODUCTION

CORDIC is an acronym for Coordinate Rotation Digital Computer. It is classes of shift add algorithms for rotating vectors in a plane, which is usually used for the calculation of trigonometric functions. The CORDIC algorithm has become a widely used approach to elementary function evaluation when the silicon area is a primary constraint. The CORDIC algorithm was developed by J. E. Volder in 1959 for the computation of trigonometric functions. This has been recognized as the best compromise between the table look up approach requiring large memory, and polynomial approximation method, which is slow to converge to the desired precision.

In 1971, Walther has generalized this algorithm to implement rotation in circular, linear and hyperbolic coordinate systems. Since then it has been used as an elegant method to realize elementary functions such as multiplication, division, logarithmic and exponential functions in addition to the computation of two dimensional vector rotations. These transcendental functions are the core for many applications such as digital signal processing, graphics, image processing and kinematic processing. The implementation of CORDIC algorithm requires less complex hardware than the conventional method.

Angle recoding schemes, mixed-grain rotation and higher radix CORDIC have been developed for reduced latency realization. Parallel and pipelined CORDIC have been suggested for high-throughput Computation.

I. METHODOLOGY

A CORDIC can be operated in two different modes, the vectoring and the rotation mode. In vectoring mode, coordinates (x,y) are rotated until y converges to zero. In rotation mode, initial vector (x,y) starts aligned with the x-axis and is rotated by an angle of θi every cycle, so sifter n iterations, θn is the obtained angle. All the trigonometric functions can be computed or derived from functions using vector rotations. The CORDIC algorithm provides an iterative method of performing vector rotations by arbitrary angles using only shift and add operations. The algorithm is derived using the general rotation transform. The CORDIC algorithm performs a planar rotation. Graphically, planar rotation means transforming a vector (x,y) into a new vector (x',y'). Vector V, came into image after anticlockwise rotation by an angle ϕ. From Fig.1 & 2, it can be observed that

$x' = x\cos\varphi - y\sin\varphi$ (1a)

$y' = y\cos\varphi + x\sin\varphi$ (1b)

Which rotates a vector in a Cartesian plane by the angle φ. These can be arranged so that:

$x' = \cos\varphi.[\, x - y\tan\varphi \,]$ (1c) $y' = \cos\varphi.[\, y + x\tan\varphi \,]$ (1d)

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Implementation and Validation of Skien Cryptographic Hash Function Using High Speed Reversible Adders in Verilog Hdl

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Abstract: *Security has become a curial aspect in the design and use of computer system and network. Hash functions are used for many applications in cryptography mainly in digital signatures and message authentication code and in network security. Hash functions play a significant role in today's cryptographic applications. SHA (Secure Hash Algorithm) is a famous message compress standard used in computer cryptography, it can compress a long message to become a short message abstract. In this paper, SHA is implemented using Verilog HDL. In this paper encryption and decryption of the of the cipher text is implemented using SHA algorithm, where different types of adders are used in the process of encryption and compared. The proposed work deals with the construction of high speed adder circuits. Design and modeling of various adders like Ripple Carry Adder, Kogge Stone Adder, and Brent Kung Adder is done by using CMOS and GDI logic and comparative analysis is coated.*

Keywords—*Ripple Carry Adder (RCA), Kogge Stone Adder (KSA), Brunt Kung Adder (BKA), Multiplier using adder, Gate count, number of transistors, Power, and Delay.*

I. INTRODUCTION

ADDERS are a key building block in arithmetic and logic units (ALUs) and hence increasing their speed and reducing their power/energy consumption strongly affect the speed and power consumption of processors. The variations increase uncertainties in the aforesaid performance parameters. In addition, the small sub threshold current causes a large delay for the circuits operating in the sub threshold region. Recently, the near-threshold region has been considered as a region that provides a more desirable tradeoff point between delay and power dissipation compared with that of the sub threshold one, because it results in lower delay compared with the sub threshold region and significantly lowers switching and leakage powers compared with the super threshold region. There are many adder families with different delays, power consumptions, and area usages. Examples include ripple carry adder (RCA), carry increment adder (CIA), carry skip adder (CSKA), carry select adder (CSLA), and parallel prefix adders (PPAs). In electronic, an adder is a digital circuit that performs addition of number. In many computers and other kind of processors, adders are used not only in the Arithmetic Logic unit (ALU), but also in other parts of the processors. In this paper a different set of adders like RCA, KSA, BKA are of the adders are tabulated. Addition is the most fundamental operation in any digital system. A simple adder performs the addition of given two numbers and the result is sum of those two numbers. Multiplication operation greatly depends on adder operation as it is one of the key hardware block in most digital signal processing system. Its main block is Arithmetic unit. The number of multiplication operation is performed by a series or parallel addition concept.

With the advances in Very Large Scale Integration (VLSI) technology, arithmetic operations are penetrating into more and more applications. The basic operation found in most arithmetic components is the binary addition and Multiplication. Computations needs to be performed using low-power, area-efficient circuits operating at greater speed. Addition is the most basic arithmetic operation; and adder is the most fundamental arithmetic component of the processor. In addition, each of the resulting output bits are depending on its corresponding inputs. It is very important operation because it involves a carry ripple step i.e the carry from the previous bits addition should propagates to next bits of addition.

Multiplication is an operation that occurs frequently in digital signal processing and many other applications. The present development in processor designs aim is design of low power multiplier. So, the need for low power multipliers has increased.

DESIGN AND IMPLEMENTATION OF NOVEL AREA EFFICIENT SCAN BASED LBIST USING LP LFSR

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Abstract— Testing is a fundamental step in Very-Large-Scale Integration (VLSI) design. There are two major steps in VLSI testing. They are Test Generation (TG) and Test Application (TA) . The objective of TG is to produce test patterns for adequate testing and TA is the process of applying those test patterns to the CUT and analyzing the output response. The whole process is performed by LBIST. To handle the rapid increasing complexity of testing, VLSI circuits is to incorporate Logic Built-In Self Test (LBIST) structures. However, LBIST architecture calls for increased area overhead. So it is very important to keep this area overhead to a minimum. And by applying test vectors Power Droop (PD) may appear in LBIST which will generate a delay affect on the circuit under test (CUT) and it is recognized as a fault. So here in this paper, we designed a novel area efficient scan-based LBIST, and it is achieved by using the LP-LFSR and also by proper modification of test vectors. As a result, 72.5% of area and power droop of proposed system is diminished than the existing method and by SA high fault coverage is also achieved. The proposed design architecture has been coded in VERILOG HDL and the software used is Xilinx 13.2.

Keywords—*VLSI, LP LFSR, Power droop (PD), LBIST, CUT, Test Generation, Test Application, SA.*

I. INTRODUCTION

LBIST stands for Logic Built-In-Self-Test. now-a-days logic blocks at-speed test are performed by using LBIST (LBIST). It depends on the CUT which is either a sequential circuit or combinational circuit [8], [12]. It is achieving importance by providing oneself test ability to logic thus, the IC can check itself which completely diminishes the use of external equipment & also by finding faults in a circuit design reduces the difficulty in VLSI testing.

There are two primordial capture-clocking methods in scan based LBIST. They are: 1) the skewed-load (also called as launch-on-shift (LOS)) method and 2) the board-side (also called as launch-on-capture (LOC)) method.

In skewed-load method, Test Vectors are employed at the prior clock of the expedient period in the circuit under test and at the following seized the outputs from CUT are studied on the scan chains.

In the board-side method, during the expedient period, TV are initially fed into the scan chains(SC); then, in seized period, TV are applied to the CUT, and the CUT output is indentured on scan chains.

It experiences a Power Droop (PD) challenges, because of high Activity Factor which is caused by the application of test patterns. Particularly through the capture phase..

The increase in power droop (PD) and area are major concerns for ICs' testing. Excessive power droop (PD) will lead to IC fail, due to the abrupt changes in circuit activity (CA). So there is need to reduce the excessive pd and area.

In this paper, TG is done by using LP-LFSR which generates the test vectors to diminish the circuit activity and switching activities of the CUT.

II. LITERATURE REVIEW

"Low power BIST for scan-shift and capture power" Proposed by Y. Sato, S. Wang, T. Kato, K. Miyase, and S. Kajihara, in Nov.2012[2] presents a paper which had been examined greatly to attain precise and systematic testing. However, there are numerous enlightened approaches for scan-test, but there are less for LBIST due to its unmanageable randomness. Although, LBIST presently becomes more essential for design amend. Authors designed a new LP BIST technology which decreases shift-power by preventing the prescribed uplifted frequentness partly vectors and also decreases the capture power. The authors demonstrates the proposed technology not only reduces test power but also keeps test coverage with less loss.

"A low power pseudorandom BIST technique", Proposed by N. Z. Basturkmen, S. M. Reddy, and I. Pomeranz, in Jul.2002[9], suggests a new pseudo-random BIST method for scan designs, which is utilized to decrease the consumption of peak power. This approach decreases the switching activity in both the scan chains and circuit under test by limitation of scan shifts to a part of the scan chain configuration using attenuation of scan chain. On different benchmark's circumambulate showed that this decreases the switching activity. The authors demonstrates that their paper will surely decreases the switching activity which are produced by scan shifts.

"Automated synthesis of large phase shifters for built-in self-test,"Proposed by J. Rajski, N. Tamarapalli, and J. Tyszer, in Oct. 1998[10] -This proposes a novel method for the self-operating synthesis of phase shifters – here components are

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REVIEW OF WEATHER RADARS - PAST, PRESENT AND THE SCOPE FOR FURTURE MODIFICATIONS WITH TECHNOLOGY INNOVATION

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ABSTRACT

Predicting the atmospheric changes has turned crucial today. Be it a travelling from one place to another or giving a timely weather report, everything relies on the prediction of the atmospheric changes. Radars are used for this purpose. Weather radar is considered as one of the most significant instruments developed for forecasting weather to meet the International safety standards. The high resolution data in lower layers of atmosphere, which is a crucial need for the aircraft operations is provided by Doppler radars. The current running NEXRAD, NEXT GENERATION WEATHER RADAR system has been proved to be of great value as of date. Also further modifications are under research with Indian Aircraft Industry, making it suitable for all weather conditions. Developing hardware and software technologies offer a promise for the manufacture of an efficient radar system. Approaches such as Adaptive waveform selection and volume scan patterns are helpful for optimizing the functioning of the radar in different weather conditions. All types of radars are not used in weather predictions. Known to all is that radar systems with phased-array antennae can support a broad range of applications. The design of weather radars have undergone various transformations due to rapid development in the technologies.

Key words: Adaptive Waveform Selection, High resolution, NEXRAD, Phased Array Antenna, Volume Scan Patterns.

I INTRODUCTION

To observe and predict the changes occurring in the weather is getting more and more important in today's world for different reasons. Weather forecasting is relying on unified observations from various systems that are non-synchronous in time. Weather radar is an instrument that provides an update regarding the climate and volumetric

Performance analysis of iPR-FBMC with Maximal Ratio Combining

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Abstract-: Diversity combining techniques are an efficient way to reduce the effect of multipath fading and co-channel interference. In this paper we establish the use of diversity combining techniques to enhance the performance of imperfect reconstruction Filter Bank Multi-Carrier (iPR-FBMC), which doesn't require the use of orthogonality and Cyclic Prefix, this leads to increase in the spectral efficiency. We propose iPR-FBMC with Maximal Ratio Combining (MRC) to enhance its performance in terms of achievable rate and BER. Also, the performance of iPR-FBMC in multiuser communication with different subband allocation schemes is compared. Our simulation result shows that employing the diversity combining technique enhances the performance of iPR-FBMC

Keywords: Diversity combining, iPR-FBMC, Achievable Rate, cyclic prefix.

I.INTRODUCTION

By employing the use of diversity techniques, the effect of multi path fading and co-channel interference can be reduced. The basic idea of diversity is to provide two or more inputs at the receiver. If one signal experiences deep fade another independent path may have a strong signal. The fundamental principle of a diversity combining technique is to combine the multiple received signals of a diversity reception device into a single improved signal [1]. Amongst different diversity combining techniques available, Maximal Ratio Combining technique provides most acceptable results contrasted with remaining techniques [2, 3]. The performance of MIMO (Multiple Input Multiple Output) system under different channels with different diversity techniques provides that the Maximal Ratio Combining (MRC) is a good choice for MIMO and BPSK modulation scheme most suitable modulation for MRC equalizers [4]. [5] Proposed a method of utilizing channel diversity to increase the secrecy capacity in the wireless communication system. The Maximal Ratio Combining of channel diversity can enhance the security of the wireless communication system in normal operating scenarios. Based on these facts, we presume that the Maximal Ratio Combining is an efficient way to improve the performance of a wireless communication channel. The comparative analysis between FBMC and OFDM in [6] states that FBMC offers a number of advantages that may make it a more viable technology for many upcoming and future communication systems and FBMC outperforms the OFDM in many areas like uplink transmission, Cognitive Radio, PLC and DSL Communication systems etc. There is no necessity of Cyclic Prefix in iPR-FBMC compared to OFDM prompts more spectral efficiency for long data packets [7].[8] Proposed to combine OFDM with FBMC which does drops the orthogonality, but the symbol rate is halved as only half of the subbands are active for each data block thus it actually stores the orthogonality in time domain. In [9] took a further step and proposed iPR-FBMC without CP at all and concluded that iPR-FBMC is to be more competitive waveform for future generation cellular communication. In this work, we extended the existing work by including maximal ratio combining to enhance the performance of iPR-FBMC.

This paper organized as follows, existing and proposed methods described in section 2. Section 3, 4 of this paper presents the achievable rate and multiuser communication of iPR-FBMC. The simulation results are provided in section 5. Conclusions are drawn in section 6.

II.SYSTEM MODEL

A. Existing PR-FBMC System:

In the existing system, a non-orthogonal FBMC system without PR constraint is proposed by challenging the necessity of perfect reconstruction in both OFDM/OQAM (OFDM with offset QAM) [10] and EMFB (Exponential modulated filter bank). In the iPR-FBMC constraints on the prototype filter is relaxed. Now the filter could focus on improving the detection performance instead of having to meet the PR constraint. The existing iPR-FBMC system model derived from PR-FBMC (EMFB) system model [11]. The block diagram of the existing system is same as that of the proposed system with the exception of maximal ratio combiner as Diversity combining technique shown in fig (1).

The SFB (Synthesis Filter Bank) and AFB (analysis Filter Bank) are adopted at the transmitter side and the receiver side in order to process the message symbols. The upsampling and downsampling factor P is chosen as smaller than or equal to the number of subbands M. Due to the critical sampling at the receiver perfect symbol detection is

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Design and Implementation of ITLC System Using FPGA

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Abstract: This paper presents an idyllic method for controlling the traffic in metro cities without disturbing the surviving system. Conventional traffic systems can be installed for a non-dynamic number of intersections with fixed counts of signal durations and are typically microcontroller based. The proposed system pattern is implemented on FPGA which offers many advantages over microcontroller such fast speed, number of input/output ports and enhanced performance coupled with low than ASIC design. The system not only provides the protection but also saves the time, money and provides the polluted free environment. This paper designed of intelligent transportation of system (ITS) using VHDL. Also determines the traffic in each road by using sensors. Using the traffic status we can manage the signal time and in this way we can handle the traffic on road. On each particular way junction we can place the IR sensors which detect the traffic density and give the current traffic status particular way in the junction. Its function was verified and simulated by using Model Sim.

Keywords: ITLC, FPGA, IR Sensors,VHDL,FSM,Model Sim.

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I. INTRODUCTION

In recent year's implementation of smart cities are essential for sustainable urban development. One of the major problems faced by cities today is traffic congestion. Traffic light controller (TLC) is used to lessen or reduce conflicts at area shared among multiple traffic streams which is called crossings [8].Traffic jams causes a rise in the cost of transportation as well as it affects the routine lives of people [9].

Traffic congestion is a critical difficulty in many of the cities and towns all over the world [6]. Traffic congestion has been causing many setbacks and encounters in the major and most busy cities all over the globe. To travel within the cities to the place of work or recreation has become a big problem to the commutates all along. Due to these problems people lose time, money and most importantly the energy resources will be exhausted due to the continual use in the automobiles. This traffic jam directly impacts the productivity of the workers, traders, suppliers and in all disturbing the market and raising the prices of the commodities in a way. To solve these traffic related problems, we have to build new conveniences & infrastructure but at the same time make it smart. The only drawback of making new roads on facilities is that it makes the surroundings more congested, but then this will make a way to have new ways to ease the traffic. Perhaps all the countries are working to accommodate the traffic flow and advance transportation and reduce the demand of vehicle use.

At road crossings traffic lights or traffic lamps or traffic signals are generally positioned so as to control the traffic flow. It is an electronic system generally mounted on an intersection so as to notify the safety related issues with the help of specific predefined colour system (usually red, yellow and green. Traffic light controller (TLC) has been applied using ASICs, FPGAs and microcontrollers. Some of the advantages of FPGA over microcontroller consist of the number of I/O ports, speed of processing and performance, all of which are extremely critical in the design of TLC. The cost also is an enormously important issue in design of TLC [7]. The reduced cost increasing the use of FPGAs (Field Programmable Gate Arrays) for verification and carrying out of a upcoming system.[7]

The traffic congestion due to the exploding increase of vehicles became the severest social problems and it has a major effect on the economy of a country. Therefore, many researches about traffic light system have been done in order to overcome some difficult traffic phenomenon but current research had been limited about present traffic system in well-travelled traffic scenarios. There are several models for traffic simulation. In our research we focus on optimization of traffic light controller in a city using IR sensor and Traffic light controller system by FPGA.

Many system designs that used to be built in custom silicon VLSI are now implemented in Field Programmable Gate Arrays. This is because of the high cost of building a mask production of a custom VLSI especially for small quantity [1]. Through using VHDL language to the traffic light controller design, the traffic light control circuit uses digital signal automatic control to realize two groups of lights which are red, yellow and green[4] Those lights command vehicles and pedestrians passing safely at the crossroad, which bases on the data

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Extended Privacy Protection with Flexible Architecture in RFID Using Variable Key Scheme

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Abstract: ***This paper presents the design of RFID system with highly secured features. Privacy protection is the major concern when RFID applications are deployed in our daily lives. The existing RFID coding scheme namely random flipping random jamming (RFRJ) is used to protect tags content. But, when a bit flipping by jamming fails, eavesdropper decodes with probability 1. otherwise, it can successfully decode with probability 0.5 by random guessing. To overcome this problem, we redesign a RFID system with more secured features using variable key scheme. A survey and brief comparison of the algorithms are performed and the modified tea is selected as a feasible solution for encryption and decryption with an acceptable level of security. In this paper, implementation of variable key scheme (MTEA) RFID tag using VHDL simulations, corroborate the functionality of the protocols and techniques are compared in terms of timing, cost, security and performance. Potential improvements to enhance the security and strengthen RF communication during authentication are explored.***
Index Terms: RFID Security, RFRJ, Variable key scheme.

I. INTRODUCTION

Radio frequency identification (RFID) is a rapidly developing field and technology that emerged in the last decade. This technology is employed by using implantable microchip devices also known as RFID tags. In a security, tracking has been improved with RFID. Different objects including humans, goods, vehicles, assets, etc. can be easily tracked using RFID technology. RFID technology is typically composed of three key elements: 1.an RFID tag, or transponder, that carries object-identifying data.2.an RFID reader, or transceiver, that reads and writes tag data.3.a back-end database, that stores records associated with tag contents.

A device called an RFID tag (or simply a tag) is a key component of the technology. An RFID tag usually has at least two components: 1.an integrated circuit for modulating and demodulating radio signals and performing other functions; 2.an antenna for receiving and transmitting the signal.

An RFID tag can perform a limited amount of processing and has small amount of storage. Each tag contains a unique identity code. An RFID reader emits a low-level radio frequency magnetic field that energizes the tag. The responds to the readers query and announces its presence via radio waves, transmitting its unique identification data. This data is decoded by the reader and passed to the local application system via middleware. The middleware acts as an interface between the reader and the RFID application system. The system will then search and match the identity code with the information stored in the host database or backend system. In this way, accessibility or authorization for further processing can be granted or refused, depending on results received by the reader and processed by the database.

Tag data: RFID tags are considered as dumb devices, in that they can only listen and respond, no matter who sends the request signal. This brings up risks of unauthorized access and modification of tag data. In other words, unprotected tags may be vulnerable to eavesdropping, traffic analysis, spoofing or denial of service attacks.

Eavesdropping or Skimming: Radio signals transmitted from the tag, and the reader, can be detected several meters away by other radio receivers. It is possible therefore for an unauthorized user to gain access to the data contained in RFID tags if legitimate transmissions are not properly protected.

Any person who has their own RFID reader may interrogate tags lacking adequate access controls, and eavesdrop on tags contents. In this paper, we present the design and implementation of security-enabled RFID tag with flexible architecture. We target a low-area design that requires as little resources as possible such that the tag production does not exceed the practical limits of a possible commercial launch.

In this paper we proposed a new scheme. This scheme is variable key scheme by using modified tiny encryption algorithm (MTEA). The MTEA algorithm is lightweight consuming minimal resource. The proposed RFID tag security is extended by using variable key scheme.

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Emotion Specific Feature Representation by using Mel-Frequency Cepstral Coefficients

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Abstract— Emotion Recognition from speech is a new field of research, it has number of applications. One of the applications is Human machine interaction (HCI). This research work focused on the development of various state-of-the-art AER techniques to recognize emotions in Telugu. It also compared the performance of these techniques and designed new enhanced ones for the better operation of the emotion recognition system. The effect of DWT, cepstral coefficients in the detection of emotions is performed and also a comparative analysis of cepstrum, Mel-frequency Cepstral Coefficients (MFCC), pitch on emotion classification is done. The classification task is done by using artificial neural network's back propagation algorithm. The Developed method shown improved recognition rates of identifying four emotions from Telugu database .Misclassification rate is reduced.

Keywords— AER, DWT, MFCC, Cepstrum and Pitch, ANN. Introduction

I. INTRODUCTION

Speech emotion recognition is the process of identifying emotions from the speech input signals. It is very difficult to predict human emotions quantitatively. Though facial expressions and gestures are the best ways to figure out one's emotions, it becomes difficult to identify them as the age of a person increases, because people learn to control their expressions with age and experience [1]. For instance, it can be used to auto remote telephone service center for discovery of dissatisfaction of customers or remote teaching to timely recognize emotions of students for proper treatment for the purpose of improving teaching quality [6]. It can also be used to the criminal scout for auto detection of psychological state of criminal suspects and auxiliary lie detection [7]. It is observed that SER provide efficient communication between human being and a machine in Human and Machine Interaction (HMI) applications. Earlier research work [1] have used MFCC and enlarged MFCC for feature extraction and failed to identify the emotion i.e. sad and also emotion recognition rate is very poor. To improve the same speech signal is preprocessed before extracting emotion specific features.

II. EMOTION CORPUS

Telugu database is considered for training and testing the Artificial Neural Network. One male and one female speaker's voices are recorded with four different emotions namely angry, happy, neutral and sad.

III. DISCUSSION

This section explains process involved in the planned method. The total practice is carried in two steps. First step involve extraction of features using DWT, MFCC, Cepstrum. Second step is classification process. Artificial Neural Network is used as pattern recognizer and a classifier.

IV. PROPOSED SYSTEM BLOCK DIAGRAM

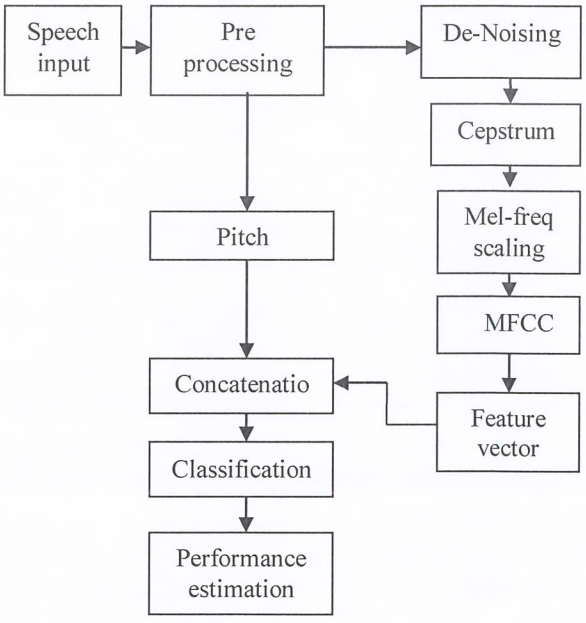

Fig.1.Speech emotion recognition block diagram.

High Speed and Reliable Gray Mapped Polar Codes

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Abstract— Polar codes have taken a great leap forward in channel coding which has many applications such as fifth generation wireless networks ,robotics and speech converter. When the number of iterations increase, the potential of polar codes is not so striking due to latency and high computation complexity of decoding methods like SCD and BPD. Therefore, based on the idea of gray mapping, we present a pre check scheme with two decoder's namely hard decoder and pure-soft decoder which balance the data reliability and decoding latency. The hard decoder is designed to correct the number of erroneous code words with lesser latency, while the soft decoders aim to correct code words which contain larger amount of errors with long latency. This shows that the polar code concatenated with pre check scheme outperforms the traditional approaches like Turbo codes.

Keywords: *Polar codes, gray map, Error correction code, Pre check scheme*

I. INTRODUCTION

Data transmission has become a vital foundation of our society as effective and more reliable communication services of this ever growing digital world have obtained a significant importance. The amount of data transmitted in the world per second is barely estimable, and it is experiencing an exponential growth. Therefore the capability to transmit fast and reliably has become more and more significant. Channel coding addresses the topic of reliable data transmission. Its purpose is to maximize both the rate at which information is transmitted and its reliability. The revelation of polar codes by Arikan in 2008 [1] spoke to be a noteworthy leap forward in the coding hypothesis. They are the top notch of codes that provably accomplish limit with respect to memory less symmetric channels with low encoding and translating intricacy. Moreover, their express development and recursive structure make them particularly reasonable for quick and productive equipment usage, the colossal intrigue they have stimulated, their useful effect and applications in 5G *[3]* institutionalization as an official channel coding is surprising.

Polar codes soften the wheel to some degree up the field of channel coding. Polar codes work on blocks of images/bits and are in this way in fact individuals from the block code family. The development of these codes take after an extremely unconventional approach contrasted with more customary methodologies like turbo codes proven to achieve the capacity for binary-input symmetric as well as discrete and continuous memory less channels.

Polar codes can be constructed with an efficient encoder and decoder with complexity O (n log n), where n represents the code length. Diverse decoding approaches [3]-[5] for polar codes have been proposed and in those, successive cancellation decoding and belief propagation decoding are the two most popular methods. SCD is serial in nature which suffers from long latency, though it requires less computation.However BPD is parallel in nature, with the increase in number of iterations latency and energy dissipation increases exponentially.

Therefore, the system should be embedded with a appropriate error correction code to guarantee the data integrity and reliability. We proposed the pre-check scheme which is a multi-strategy polar code scheme to strike balance between data reliability and decoding latency. It is embedded with two decoder's namely hard decoder, pure-soft decoders. The hard decoder is mainly designed to correct the more no of erroneous code words unlike the pure-soft decoder to correct code words with larger amount of errors. Also gray mapping scheme is introduced for better error correction performance.

The rest of this paper is organized as follows. Section II gives an overview of polar codes & Existing BPD decoder. Section III introduces pre check mechanism with gray code as mapping scheme. Section IV gives the performance analysis whereas Sect V presents the implementation results. Section VI draws the conclusion.

II. EXISTING METHOD

Polar codes are a linear block code which depends on the phenomenon of channel polarization, where every channel combine and split recursively, such that their mutual data tends toward either 1 or 0. It means, some of these channels become noise-free completely, while rest becomes noisy [3]. Further, the fraction of noiseless channels tends toward the capacity of the underlying binary symmetric channels. Limit accomplishing polar codes have increased noteworthy consideration as of late. Polar codes can be decoded by either successive cancelation or (BP) calculation.

A strategy portrayed known as channel polarization, to develop the arrangements which accomplish the proportionate limit of the double info discrete memory less channel. The proportionate limit is the most astounding one which can be subjected towards utilizing the info with rise to likelihood. This strategy alludes the way that it is conceivable, of autonomous errors.

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Wireless sensor Network based Industrial Automation using Internet of Things (IoT)

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ABSTRACT
In this project, the sensor related information will be transmitted to the user by avoiding collision of IoT. The Internet of Things is the software, things embedded with electronics, sensors and network connectivity. In industries, most of the workers will lose their lives because of not having any safety cautions or alarm indications. For example, an alarm indicating the emergency of high temperatures and high humidity in work area. This sometimes results in damage of machineries too. This project solves the situation by providing an alarm/Buzzer indication whenever temperature or humidity increases in the work area. System user frequently notified with sensors data and if any high temperature/humidity values arise, an alarm or buzzer will indicate or caution the workers to be more alert in the work area. Some of works in industry should follow the temperature and humidity values are in certain range for reliable output. If temperature and humidity sensors values are exceeds then buzzer will horns. The main advantage of IOT based IWSN is data transmission without collision, safety and secured.

Keywords: Internet of things (IOT), wireless sensor networks, temperature and humidity sensor.

1. INTRODUCTION

Now a day a broad range of industrial IoT requisitions have been improved and organized. Evolution begins from RFID method that permits microchips to transmit the reorganization data to an observer by wireless communications. Through utilizing RFID readers, individuals could detect, track, and observe whatever objects attached with RFID tags naturally. Another innovation will be the WSNs (wireless sensor networks) that mostly utilize interconnected intelligent sensors to sense and screening. Its provisions incorporate environmental monitoring, traffic monitoring, and industrial monitoring. Both WSN and RFID would use to improve IoT.

There are numerous things we hear about industrial IoT as it is new developing method. We utilize sensors to constantly monitor industry appliances [1] that are highly difficult to control by human. We are going to improve auto-monitoring system to produce alert and notification through SMS and email on any digital (Computer and smart phone) device. Current advances in wireless sensing method encourage the additional optimization and development of the service provision processes and product.

The IWSN (Industrial wireless sensor networks) are a developing class of WSN, which appearances particular imperatives interfaced to the particularities of the mechanical production. For these terms, IWSNs countenances a few tests like the robustness sand reliability in harsh environments, and also the capacity to appropriately perform and attain the objective over parallel with every last one of other mechanical procedures. IWSN [2] results ought to be versatile, straightforward to use and install low cost, long lifetime gadgets indeed, the blending of prerequisites hard to meet. Dependent on the particular prerequisites of the industrial production, the Industrial wireless sensor networks requisitions could be ordered into 3 groups:

1.1 Environmental sensing

This bunch usually signifies the widest field of WSN provision these days. The IWSN requisitions for environmental sensing cover the issues of water, air pollution, however covers the generation material pollution checking also. In addition, in unsafe environments, there are various requirements for fire sensing, surge sensing. Lastly, the security problems happen in markets with challenging service providers and product providers, [3]-4] where IWSN are utilized for point of the interest, barrier monitoring, and area.

1.2 Condition monitoring

This bunch usually covers the issues of structural condition monitoring, giving both the machine condition monitoring and structure health data including probable automatic support. Consequently, this assembly of IWSN requisitions is crucial for the production in the whole the extensions of business.

1.3 Process automation

The most recent assembly of provisions gives the clients with the majority of the data in regards the assets for the production and service provision. Lastly, the most significant issue from the client viewpoint will be the production execution monitoring, assessment and develop that are attained through IWSNs. The basic overview of the system shown the figure 1.

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Analysis of static and dynamic CMOS low power high speed NP Domino logic

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ABSTRACT
A low cosset configuration and basic with implement, CMOS NP domino logic is introduced. Those NP domino rationale plans require fewer transistors F are perfect for full domino rationale. The execution from claiming NP domino rationale will be also better contrasted with the standard domino rationale usage. Changing domino rationale would thick, as great yet needed huge numbers tests like monotonicity, leakage, charge offering Furthermore clamor issues. These issues are completely wiped out in the CMOS NP domino rationale (which is otherwise called Zipper circuits) without whatever punishment on execution or silicon range use. This paper compares NP domino rationale for static CMOS and domino (dynamic) rationale configuration usage.
Keywords: CMOS, NP domino logic, monotonicity, zipper, static

1. INTRODUCTION
Changing CMOS circuits would do well to execution and need less silicon zone over traditional static CMOS circuits. Here the different progressive scheme to needed be planned, domino CMOS, NORA CMOS pipelined rationale structures and so forth. [1][2]. All these configuration styles utilizes an absolute stage clock should drive their circuit's gates, exploiting the full intrinsic pace of the changing entryways. Those dynamic stage for every last bit domino CMOS is created of N rationale and dispenses with those inner race states by utilizing An cushion In those yield about each phase that produces main non inverting indicator. This issue may be illuminated Previously, NP domino (Zipper alternately NORA) [3] circuits which utilize An pipelined structure from claiming NP CMOS Also clocked CMOS latches. Since NP domino circuit needs no inverter toward that yield for every stage, it will be for the most part created of fewer transistors over domino CMOS circuits. It likewise offers All the more legitimate adaptability toward giving work to both inverting and non inverting signs at that yield. The elements Domino CMOS circuits also endure starting with sign corruption initiated by spillage present furthermore accuse redistribution. Huge numbers elective results in intricate clocking, additional transistors alternately substantial buffer [2] have been recommended to unravel these issues. In this paper, we present a CMOS that incorporates every last one of preferences for domino CMOS. NP domino CMOS would safe of the issues about precariousness Furthermore charge-sharing. Those range usage will be also superior to those domino CMOS. In the area that follows, we will portray the dynamic CMOS structure and its Characteristics Furthermore after the fact manages the execution from claiming NP domino CMOS rationale circuits [4].

1.1 Logic Styles
Those cascading from claiming element rationale starting with you quit offering on that one entryway with other provides for issue. Those precharge "1" state of the principal entryway makes those second entryway should release prematurely, preceding the primary entryway need arrived at its right state Concerning illustration demonstrated clinched alongside fig. 3. These employments up the pre charge of the second gate, which can't a chance to be restored until those next clock cycle, hence there will be no recuperation from this slip. The result will course dynamic rationale entryways is domino rationale that inserts a standard static inverter between those two phases. In spite of the inverter need a pMOS (one of the fundamental objectives for changing rationale will be should abstain from pMOS the place possible as shown in figure 1& 2, because of speed), there would two motivations it meets expectations great.

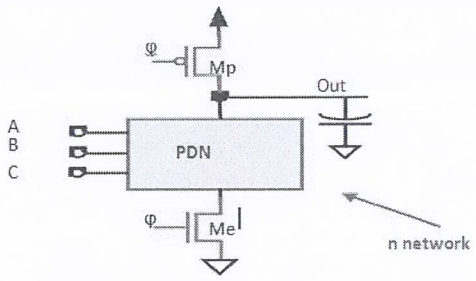

Figure 1: Dynamic logic (block diagram)

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Conventional Full Adder FinFET Implementation using Transmission Gate logic

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ABSTRACT
This paper examined the similar Investigation from claiming distinctive full adder phones with two rationale styles. Those rationale styles utilized for execution about FinFET based 1-bit full snake need aid reciprocal MOS (CMOS) Furthermore transmission entryway (TG). The simulations from claiming full adders bring constantly completed during 10nm, 20nm Also 32nm innovation organization hub. This model may be dependent upon BSIM-CMG, a committed model for multi-gate units. Examination about execution Furthermore vitality proficiency of all sorts from claiming full adder cell outlines need been carried out. The execution measurements that were measured broke down Furthermore compared would Normal power, spillage power, delay and vitality. It is watched that little control is devoured previously, transmission entryway (TG) built full adder over those gathering full adder on 10nm innovation hub.

Keywords: Logic styles, Full adder, FinFET

1. INTRODUCTION
Presently day, the interest for packed in the secondary presents little energy Furthermore strong chip will be expanding step by step. That central processing unit (CPU) will be the center of every chip. That math logic unit (ALU) will be key component of chip spotted over CPU. ALU can perform intelligent procedure and fundamental math procedure, namely, addition, subtraction, multiplication, What's more division. The number-crunching operation could a chance to be performed as takes after: addition, negative addition, [1] [2] repeater addition, and repeater negative expansion. Done advanced framework to nanotechnology node, it may be required to plan a full snake similar to bring low control utilization, secondary velocity, vitality capable and dependable.
So, secondary velocity, low power, vitality capable, and dependable microprocessors are popular in the most recent Also imaginative silicon innovation organization methods have prompted those fast development for present day integrated chip (IC). The VLSI microprocessors could make tended to during Different plan levels for example, architectural, circuit, design and more creation. Outlining a math unit at An specific out level impacts its execution [3] Likewise Different execution figuring out elements for example, such that exchanging capacitance, move action Furthermore hamper present would determinedly impacted by decided rationale style. So, those target of the paper should figure out the best proficient rationale style the middle of CMOS Also TG to 1-bit full snake circlet.

2. OVERVIEW OF FINFET TECHNOLOGY
As shown the below figure 1 FinFET will be a non-planar gadget Hosting fin such as formed the place the entryway may be wrapped around Furthermore again the balance which goes about similarly as a transistor channel. It is additionally termed similarly as quasi-planar gadget concerning illustration those current streams parallel on wafer plane and the channel is peroxide blonde with wafer plane [4].

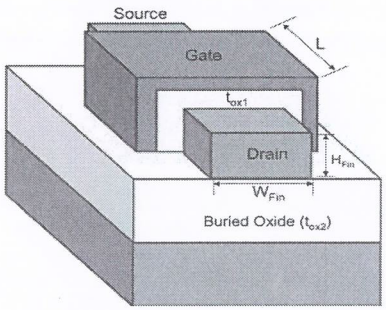

Figure 1: Block diagram of FinFET gate

Basically, FinFET may bring been organized with a chance to be constructed on silicon-on-insulator (SOI) wafers. Yet the scientists produced it sensibly with make normal for FinFETs will fill in for impostor silicon [5] wafers and move move forward the individuals execution depended with respect to certain parameters..
Capable channel length Leff = Lgate + 2×Lext (1) capable channel width w = Tfin + 2×Hfin (2). Those put Hfin Furthermore Tfin those balance tallness and additionally thickness respectively, Lgate might make length of the gate, Lext is extended sourball or channel area Concerning outline showed in fig. 1. Balance width (Tfin) expects a critical a major aspect to directing the individuals short channel sway viably. Subsequently Tfin ~ Lgate/2 might make emulated. Similarly as a FinFET structure, a ultra-thin si balance sorts a administering channel wherein [6] the individuals electrons stream from hotspot for channel. This Steering channel might a chance to be wrapped toward entryway the place enter voltages compelling reason with make supplied. Subsequently regulating the stream of electrons much in off state keeping

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Effective Analysis of Human Facial Appearance using JAFFE Images

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ABSTRACT
Those targets may be with recognizing that status of the human conduct technique In view of their facial expressions. Another perfect to identifying human face Likewise a enter symbolism and distinguishing their facial outflow utilizing characteristic extraction parameters for example, such that precise second moment, complexity Also homogeneity What's more conduct technique might have been attained utilizing base separation classifier. A facial outflow proposed system necessities on tackle the accompanying issues for example, such that facial characteristic extraction also facial outflow order. The universally acknowledged seven vital feelings with a chance to be figured it out are Angry, Happy, Sad, Disgust, trepidation and astonishment along unbiased. The suggested technique might have been assessed on the JAFFE database pictures Also logged off pictures utilizing three of the facial expressions for example, such that Happy, pitiful What's more nonpartisan. Those recommended system depicts a constant programmed facial outflow proposed system similarly as an input. The advanced fittings may be planned to feeling proposed system utilizing Verilog Also executed looking into Xilinx straightforward 3E unit. Subsequently the test outcome demonstrates that those proposed rate gets to 93. 33% Eventually Tom's perusing utilizing logged off pictures and 95. 33% Eventually Tom's perusing utilizing JAFFE dataset will be got.

Keywords: Facial Expression, FPGA, offline images, image data sheet

1. INTRODUCTION

Those turf from image processing is extremely fascinating with remember the human gesture. Feeling is a light of specific circumstances. It will be a essential analytics and only our presence. Programmed feeling present will be viewed as concerning illustration a standout amongst those essential undertaking previously, workstation vision, security, education, psychiatry and telecommunication. Facial outflow present need been those quick Creating ranges due to its provision regions for example, such that picture retrieval, biometrics Also feeling Investigation. A considerable measure of investigation need been carried out over facial out flow present by fathoming the issues happening clinched alongside present of the facial expressions under distinctive illuminations, gestures Also different varieties. That objective about this exploration fill in may be with recommend a productive system for characteristic extraction procedure to facial outflow present. Feelings are the inclination or light of specific circumstance alternately a earth. It is a result we see all the other feelings What's more respond In view of that outflow best enhances those correspondences. Pcs need aid "sensitively faced". They not perceive other feelings or have its own feelings [1].

To emotive order there need aid two fundamental feelings are there, Love-fear. In view of this we arrange the feeling under sure and negative feelings. Those six fundamental feelings would angry, happy, fear, disgust, sad, astound. You quit offering on that one that's only the tip of the iceberg outflows may be unbiased. Those representational techniques generally start with a dimensionality diminishment methodology since that secondary dimensionality of the first visual space makes the Factual estimation exceptionally troublesome & the long haul expending [2]. Those concentrated characteristic vector of the enter face is matched against the individuals of selected appearances in the database, outputting those personality of those face The point when a match will be discovered with a addition certainty or Concerning illustration a obscure face generally [3]..

2. PROPOSED METHOD

Information preparation will be a paramount period since the arranged dataset turns into information of the Verilog preparing and trying. When the picture need been obtained and concentrated utilizing the image transforming strategies need aid necessary for image transforming. Above all else picture sifting is performed on preprocessing of an image; ext those gray scale change is performed. Edge technology is used to change over a force picture on a content picture. Every last bit these stages would finish utilizing MATLAB toolmaker. The square outline of the facial outflow proposed system will be indicated as in figure 1.

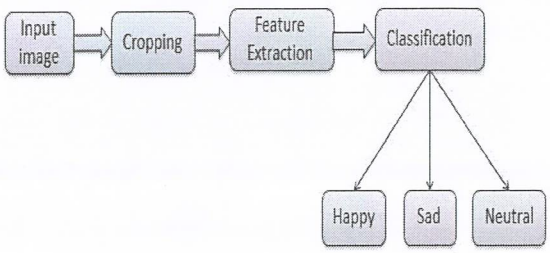

Figure.1 proposed method of the facial expression recognition system

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Implementation of Simulink model for on-Board Diagnosis of an automotive system—TPMS

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Abstract:

Automotive systems consist of mechanical, hydraulic and hardware components that implement specific vehicle functions. The increasing applications in high-end vehicles require tracking and control of each individual parameter. This paper involves the diagnosis of multiple ECUs interconnected by a message-based protocol called CAN bus. The research presents the mathematical model for advanced Tire Pressure Monitoring System by displaying the tire pressure and controlling the hazard breaking system. The paper exclusively focuses on the implementation of TPMS using graphical modeling. The main purpose of the paper is designing a diagnostic model using Simulink, which provides simulated data consistent with real-time parameters.

Keywords: *ABS, CAN bus, ECU, On Board Diagnosis, Simulink, TPMS*

1. INTRODUCTION

The escalation in a number of functionalities in new high-end cars makes it difficult to determine the fault in the system in real time. On-board diagnosis for any vehicle is necessary. OBD is a set of self-testing and diagnostic instructions programmed into vehicle's control unit. The system directly allows the driver to check the status of vehicle's various subsystems [7]-[9]. The status is determined by displaying the fault on dashboards such as MIL (Malfunction Indicator Lamp) or TPMS indicator [10] or engine check light etc. Tire pressure monitoring system alarms the car with early signaling of the hazardous state of tires. The monitoring system is developed for measuring both the tire pressure as well as temperature in real time. Furthermore, in this programming, the system is equipped with an Anti-lock braking system in order to modulate brake and speed of the car. A study by European Union states that an average under-inflation of 5Psi results rise in fuel consumption by 2% and reduces the lifespan of the tire by 25%. Therefore they made it mandatory to install TPMS in every vehicle, worldwide, as it has a great advantage in fuel saving, extending the life of tires, minimizes the risk of accidents [11].

Engineers and programmers are instructed to interface the control unit with OBD system. Few protocols, a dozen modes, hundreds of parameters, thousands of trouble codes are involved to identify the fault in the control unit. Hence to figure them all we need OBD interface, some simulations, and coding. The main objective of the research is to program the diagnostic system in Matlab-Simulink. Simulink, developed by the MathWorks, is a mathematical and graphical programming environment. It helps in simulating and analyzing the multi-domain dynamical system by interfacing with visual modeling and customizable set of block libraries. Simulink generates C source code automatically for real-time application of systems. Also, for embedded systems embedded coders generates [12] an efficient code. Hence, Simulink models are compatible with any kind of system and are flexible for code generation.

2. ON-BOARD DIAGNOSIS

OBD is a complete electronic system, which detects exhaust emission related failure in vehicles. It is a computer-based system which is designed for monitoring the performance of major engine components. An OBD system includes Engine Control Unit (ECU), Sensors, Actuators, protocols and display units. Earlier OBD would simply illuminate a malfunction indicator light as the fault was detected in the control unit but could not provide information regarding the malfunctioning. Today advanced OBD system provides real-time data along with standardized series of diagnostic trouble codes. Modern OBD uses digital communication to provide real-time data.

A systematic understanding of an integrated engine system level is essential for designing a monitoring strategy. The development work for the project begins with Simulink model designing for monitoring the condition of tires on the desktop with analysis and optimization. However, without collecting the data from ECU it is not possible to produce accurate results as required. Thus a closed-loop communication between ECU and TPMS model was established.

2.1 ECU –Engine Control Unit or Electronic Control Unit

ECU is considered as the crucial part of the Vehicle Management System. ECU, also known as an electronic control unit, controls the set of sensor data transmitted from each sensor present in the electric system to warrant ideal performance. This embedded electronic device reads the signals coming from sensors, positioned at various parts, and other parameters of different components of the vehicle. ECUs

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Implementation of Reconfigurable CORDIC

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ABSTRACT

CORDIC is an acronym for Coordinate Rotation Digital Computer. The CORDIC algorithm is a repetitive calculation approach ability of emerging different basic functions with a proper shift-and-add method Used to evaluate a large amount of functions. It has been used for many years for efficient implementation of vector rotation operations in hardware. It is executed merely by table look-up, shift, and addition operations. Rotation of vectors through fixed and known angles has many applications in animations, robotics, games, computer graphics and digital signal processing. In this paper we present improved method of shifting by using an alternate scheme by increasing the no. of barrel shifters with increasing pre shifting method and Fault Tolerance in Bi Rotational CORDIC circuits higher rate of accuracy in fixed and known rotations. The improvement in the fixed angle Rotation reducing the area- and Complexity in the application. From the basic architecture of cordic an fixed angle rotation is implemented by vector rotation. the rotation of vectors uncontrolled by the circuit till all rotations are completed it will results large system gain and unpredictable angles for effective operation of known angles in this paper angle correction ,Quadrant correction and gain correction is implemented, this paper also proposed the rectangular to polar cordic for reducing number of multiplication and addition, also mentioned the simulation results.

Keywords: *CORDIC, Quadrant amendment, vectoring and rotation modes.*

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I. INTRODUCTION

CORDIC is an acronym for Coordinate Rotation Digital Computer. It is classes of shift add algorithms for rotating vectors in a plane, which is usually used for the calculation of trigonometric functions. The CORDIC algorithm has become a widely used approach to elementary function evaluation when the silicon area is a primary constraint. The CORDIC algorithm was developed by J. E. Volder in 1959 for the computation of trigonometric functions. This has been recognized as the best compromise between the table look up approach requiring large memory, and polynomial approximation method, which is slow to converge to the desired precision.

In 1971, Walther has generalized this algorithm to implement rotation in circular, linear and hyperbolic coordinate systems. Since then it has been used as an elegant method to realize elementary functions such as multiplication, division, logarithmic and exponential functions in addition to the computation of two dimensional vector rotations. These transcendental functions are the core for many applications such as digital signal processing, graphics, image processing and kinematic processing. The implementation of CORDIC algorithm requires less complex hardware than the conventional method.

Angle recoding schemes, mixed-grain rotation and higher radix CORDIC have been developed for reduced latency realization. Parallel and pipelined

IoT Based Smart Water Quality Monitoring and Prediction System

Prashant Kamidi, Vamshi Krishna Sabbi, Ramakrishna Sanniti

Abstract: *As indicated by Human Rights Watch, twenty million individuals in our nation are as yet drinking water defiled with arsenic. The World wellbeing Organization (WHO) has likewise expressed this emergency as "the biggest mass harming of a populace ever". To diminish the water related ailments and avoid water populace, we need to quantify water parameters, for example, ph, turbidity, conductivity, temperature and so on. Conventional approach of water observing requires gathering information from different sources physically. A while later examples will send lab for testing and breaking down. So as to spare time utilization and diminishing manual exertion my testing supplies will be put in any water source. Thus, this model can distinguish contamination remotely and take essential activities. The primary objective of this paper to assemble a Sensor-based Water Quality Monitoring System. Arduino Mega 2560 go about as a base station and information from sensor hubs will be send to it. For the scholastic reason, this paper exhibits a little model of sensor systems comprising of temperature, water level, stream and ph. At that point ph and temperature sensor esteems were sent cloud stage (ARTIK cloud) and showed as a graphical portrayal on a neighborhood PC. In addition, GSM shield (SIM808) is associated with Arduino Mega which thinks about sensor esteems to edge esteems and sends a text-based notification to the operator if the got esteem is above or underneath the edge esteem. The aftereffects of this undertaking are talked about in the outcome area of the paper. We tried three water tests from three diverse water sources, (for example, modern water, faucet water and pool water). Three water tests gathered from three distinctive swimming pools.(Except one example) Ph esteem found in rest of the examples were in typical range (temperature esteem between 26-27'C). Result segment (in page 20) clarifies our venture discoveries in subtleties.*

Index Terms: *Artefacts; Framework; Feature Extraction; Ontology; Query Processing.*

I. INTRODUCTION

Environment around us consists of five key elements. These are soil, water, climate, natural vegetation and land forms. Among these, waters is the most essential element for human to live. In the 21st century, providing pure drinking water is becoming a major challenge worldwide. International governing bodies such as United Nations (UN) and World Health Organization (WHO) also recognized human right to sufficient, continuous, safe, and acceptable, physically accessible, and affordable water for personal and domestic use [1]. Impure drinking can cause life threatening disease such diarrhea, cholera, dysentery, typhoid, and polio. The research alarmingly estimates that every year diarrhea alone is causing around death of five lakh people. Figure 1 illustrates how water crisis becoming an epidemic in twenty first century [2]

Now a day's Internet of things is a revolutionary technological phenomenon. It is shaping today's world and is used in different fields for collecting, monitoring and analysis of data from remote locations. Internet of things integrated network if everywhere starting from smart cities, smart power grids, and smart supply chain to smart wearable. Though internet of things is still under applied in the field of environment it has huge potential. It can be applied to detect forest fire and early earthquake, reduce air population, monitor snow level, prevent landslide and avalanche etc. Moreover it can be implemented in the field of water quality monitoring and controlling system. We can design a water quality monitoring system in smart city where there will be a network of devices connected to remote stations and the parameters from the water sources will be stored in a microcontroller via WSN [3]. City dwellers can easily get notified about of the quality of the water via SMS or they can view it on webpage and also local authority can take necessary actions.

In the context of Bangladesh rural area is mostly expose to water pollution. As we can see from figure 2 among all the pollutions in Dhaka city, water pollution is the most contiguous. My motivation for doing this project is to design a prototype which will be feasible and cost effective for poor people. This way we can contribute to my countries development and enrich my knowledge in the field of internet of things. There is no better incentive than saving a children's life and ensure him or her healthier life [4].

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Implementation of logic gates using quantum dot cell automata

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Abstract: Quantum-dot cellular automata (QCA) are one of the most promising emerging Nano electronic paradigms used for designing computers and very large-scale integration circuits. Many applications can tolerate the errors and imprecision of digital systems; thus, approximate computing is widely used in such cases. Exclusive OR (XOR) gates are among the major gates, based on which other gates could be developed. A three-input XOR gate is considered to be a basic gate in designing compressors as one of the most important parts of the arithmetic logic unit. Several studies have focused on the accuracy of XOR gate in the QCA technology. However, using approximation in designing XOR gates remains a significant concern in this regard. To the best of our knowledge, the present study is the first to introduce a novel three-input approximate XOR gate. This gate is utilized in designing approximate 4-2 compressors for reducing circuit complexity, which can be achieved by the minimum number of the gates It is a fundamental building block in many circuits, such as adders, comparators, parity checkers, multipliers, error detectors and another kind of circuits as well. In this paper, a new low-complexity single layer XOR gate is presented in QCA technology. Implementation of the gate is based on explicit interaction cell. Hence, it is not required any special equation or technique in its construction. Overall results show that the proposed gate performs better in a case of previous XOR designs.

***Index Terms* – QCA Technique, Compressors, Quantum computing.**

I. INTRODUCTION

A cellular automaton (CA) is a discrete dynamical system consisting of a uniform (finite or infinite) grid of cells. Each cell can be in only one of a finite number of states at a discrete time. As time moves forward, the state of each cell in the grid is determined by a transformation rule that factors in its previous state and the states of the immediately adjacent cells (the cell's "neighborhood"). The most well-known example of a cellular automaton is John Horton Conway's "Game of Life", which he described in 1970

In recent years, the complementary metal-oxide- semiconductor (CMOS) technology has been shown to have high power consumption and current leakage. Further- more, it has been associated with numerous problems in making CMOS circuits smaller; such examples are various physical phenomena, the specific mass of each element, and quantum effects that disrupt the normal function of transistors. With this background in mind, researchers have been attempting to develop small-scale technologies with low power consumption and current leakage. Quantum-dot cellular automata (QCA) are an emerging nano electronic technology, which have recently been reported to have a more efficient performance. Although designing QCA circuits is far more challenging than the CMOS technology, there has been growing interest in the simple structure of these circuits, as well as the variety of the methods used for their design and manufacturing. Design of the novel approximate XOR gates has been presented. It also describes the simulation parameters used to verify the design of the proposed model and the evaluation of the results. The proposed models have been verified by their application in designing approximate compressors, and conclusions have been drawn.

Any device designed to represent data and perform computation, regardless of the physics principles it exploits and materials used to build it, must have two fundamental properties: distinguish ability and conditional change of state, the latter implying the former. This means that such a device must have barriers that make it possible to distinguish between states, and that it must have the ability to control these barriers to perform conditional change of state. For example, in a digital electronic system, transistors play the role of such controllable energy barriers, making it extremely practical to perform computing with them.

The major objective of this work is to evaluate and explore the existing 4-2 adder compressor with the modified approach with a focused goal on 4-2 adder compressor performance in addition to less delay, spatial area reduction. The designing of existing and proposed 4-2 adder compressor and results is noted by utilizing the Q- CAD tool. Predominantly less delay in addition to the reduce the number of quantum cells is the main intention of this work. Furthermore, the design is made in such a way it must reliable as well as should have less in complexity. Since aless number of quantum cells are put into operation in the small area and the delay is reduced. The modified architecture of 4-2 compressor circuit is designed using Q-CAD tool and corresponding layout are obtained.

A QCA cell consists of four quantum dots and two electrons, which can move freely among the dots. The electrons are placed at the maximum possible distance from each other due to the Coulomb repulsive force, so that the stable states occur when the electrons fill the dots diagonally. As shown in Fig. 1, these stable states are called polarizations. Two polarizations of +1 and −1 demonstrate the logical values of one and zero, respectively.

Nowadays, the enormous increase in the number of transistors in a single chip, furthermore the reduction of the size of the transistors is an essential challenge for the design of the integrated circuits and in the VLSI technology. The problem is that in this CMOS technology, the size reduction of the transistors is limited and almost impossible beyond 10 nm since it can introduce the abnormal quantum Behavior at the nano-metric scale. In order to overcome this problem, and to obtain high density, the speed with low power consumption Craig Lent and al introduced a new paradigm of the architecture of calculation. This paradigm rises from a series of developments carried out in the years 1980, on the study of systems to a low emerging number of electrons of new capacities in epitaxy allowing the manufacture of gas 2D of electrons by GaAs/AlGaAs. This paradigm is quantum-dot cellular automata (QCA) technology. A number of advantages stem from this new technology. The first is the use of the fundamental states of elementary cells to encode information (Computing with the ground state). As in CMOS technology,

DESIGN AND PERFORMANCE OF POLAR CODES FOR 5G COMMUNICATION UNDER HIGH MOBILITY SCENARIOS

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***Abstract*:** Polar coding recently invented by Erdal Arıkan, is an encoding/decoding scheme that provably achieves the capacity of the class of symmetric binary memoryless channels. The address two important problems regarding polar codes: the construction of polar codes and performance of polar codes. First, we consider the problem of efficiently constructing polar codes over symmetric binary discrete memoryless channels and provide some algorithms for channel quantization that can be analyzed for complexity and accuracy. In particular, show that the algorithm can find almost all the "good" channels with computing complexity which is essentially linear in block-length. Next introduce different methods and algorithms to enhance the performance of the successive cancellation polar decoder. The numerical evidence as well as some mathematical analysis to show that the performance of polar codes are improved by using these algorithms.

Index Terms- 5G Concept; **LTE Turbo Codes; Polar Codes; High Speed Train Channel (HST)**

1. INTRODUCTION

The purpose of communication systems is to transmit data reliably over a noisy channel. The general block diagram of a communication system. The source encoder removes the redundant information from the source's data. The channel encoder adds redundancy to the data such that reliable communication can be achieved over a noisy channel. The task of the channel decoder is to reproduce the data sent over the channel from the channel output. In the end, the source decoder reproduces the source's data from the output of channel decoder. Our main concern in this thesis will be the blocks channel encoder, channel, and channel decoder which we describe in more detail in the sequel. By using recursive structures, polar codes are constructed based on the channel polarization, where equivalent bit-channels polarize to be nearly noiseless or useless with code length tending to infinity. Since the error-correcting performance under the simple successive cancellation (SC) decoder for polar codes with finite code length is inferior to other modern codes, such as LDPC codes and Turbo codes.

5G Concept

We all know that 4G is fast, you haven't seen anything yet. With the increase of train speeds, high mobility wireless communication, which encounters challenges due to the Doppler effect with rapid time variations, arouses much attention and exploration. The forthcoming 5G communication requires peak data rates up to 10 ~ 20 Gb/s for enhanced mobile broadband (eMBB) scenario. Thus, how to fulfill the 5G requirements with coding scheme in high mobility scenarios is a challenging problem. That kind of speed, there is no end to the knows of things that 5G will make possible. It will be able to download 4K movies in the time it takes to tie a shoelace, or explore virtual reality with people from all around the world in real time. The dreams of cities filled with smart buildings and automati cars can finally become a reality. Just think of the different types movies such as I, Robot and Ready Player One. That type of technology is closer than ever to all thanks to the super-high speed and super-low delay of 5G. The 5G becomes widespread, it will cover entire countries, connecting us all does not the need for WiFi or wired connections. This 5G networks are necessary for the success of self-driving cars and smart cities.

Polar Codes

Rather than attacking the coding problem directly, the polarization approach follows a purely information-theoretic route whereby N independent identical copies of a given binary input channel are manipulated by certain combining and splitting operations to "manufacture" a second set of binary-input channels$\{W^{(i)}\}_{i=1}^{N}$ that have capacities either near 0or near 1, except for a fraction that vanishes as N becomes large. Once such polarized channels are obtained, "polar coding" consists of transmitting information at full rate over $W^{(i)}$ that are near perfect and fixing the inputs of the remaining channels say, to zero. polar codes constructed in this manner could achieve capacity with encoding and decoding methods of complexity O(N logN).So that the probability of frame error for polar codes goes to 'zero' roughly as $e^{-\sqrt{N}}$ for to fixed any rate below capacity.

Performance Analysis of Different Classifiers in Speech Emotion Recognition

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Abstract- Recognition of emotion from speech signal is a new topic in present field of research, it has plenty of applications. One of the applications is Human machine interaction (HMI). The main objective of this research work is to develop Automatic -Emotion Recognition (AER) technique to recognize emotions in Telugu. It also compared the performance of different classifiers and developed a new enhanced method for the improved performance. Spectral features will consider only few feature vectors are not sufficient for emotion classification. To extract more feature vectors the DWT is used. The effect of Cepstral coefficients in the detection of emotions is performed and also a comparative analysis of Cepstrum, Mel-frequency Cepstral Coefficients (MFCC), and pitch on emotion classification is done. The classification task is performed using artificial neural network's back propagation algorithm. The proposed method has shown better performance in identifying four emotions from Telugu database that of other classifiers (GMM, Bayesian). Classification accuracy is improved.

Keywords- AER, DWT, MFCC, Cepstrum and Pitch, GMM, Bayesian, ANN.

I. INTRODUCTION

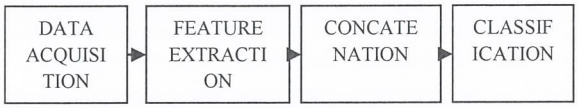
All forms of human communication carry information at two levels, the message and the underlying emotional state. Emotions are essential part of real life communication among human beings. Emotions are experienced when something unexpected happens at times. Emotion recognition is the process of examining or identifying the status of a person. The emotion recognition enable human computer or human machine interaction in future, which may possibly understand with persons or help people with communication tribulations and detection for psychiatric diagnosis, amongst other applications. Earlier research works have used different classifiers and feature extraction techniques and failed to improve accuracy and reduce misclassification. To enhance the accuracy artificial network with different nodes is deployed as classifier.

II. DATA BASE

Training and testing of the Artificial Neural Network is performed by using Telugu database. A male and a female speaker's voices of four different emotions namely neutral, angry, sad and happy are recorded. The database consists of 157 samples of both training and testing.

III. DISCUSSION

This section explains process involved in suggested method. The proposed method carried in five steps and is shown in following figure. Figure.1: Processing steps of speech emotion recognition



Data acquisition: The voice signals from different speakers are collected in this process; the data is collected so as to have four different emotions angry, sad, happy and neutral.

Feature Extraction: Spectral and prosody features are extracted using different methods. The techniques used to extract features involve DWT (Discrete Wavelet transform), Cepstrum, MFCC etc.

Concatenation: Features obtained from above process are concatenated to perform classification. The output of this process will produce a feature vector.

Classification: Classifier consider input vector and classify the emotion class based on trained data. Different classifiers used for emotion recognition

1. Gaussian Mixture Model
2. Bayesian Classifier
3. Artificial Neural network
4. Deep Networks

Gaussian Mixture model: Gaussian Mixture Models (GMMs) are among the most statistically mature methods for clustering or unsupervised learning. A Gaussian mixture model provides a good approximation of the originally observed feature probability density functions by a mixture of weighted Gaussians. Each emotion is modeled in one GMM. The decision is made for the maximum likelihood model. There are results in [11] where the authors concluded that using GMMs is a feasible technique for emotion classification.

Bayesian Classifier: Naïve Bayes classifier is based on the so-called Bayesian theorem with the naïve assumption of independence between every pair of features. This classifier in spite of the apparently oversimplified assumptions has worked quite well in many real-world situations. It is very fast and has

A CONICAL SHAPED DIELECTRIC RESONATOR ANTENNA IN X-BAND

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Abstract: Here we have Designed a Conical shaped dielectric resonator (DRA) using HFSS which is radiating at X-band, Assigning the materials with Arlon, Tarconic. By taking solution frequency 4.3GHz, Maximum number of passes 20, Max delta per S 0.02,Frequency setup type as Linear Step ,Starting frequency set to 1GHz and End Frequency 20 GHz we have simulated our project. From the result it can be observed that the antenna resonates at nearly 11.788 GHz which comes under X-band and the antenna is useful in different applicant VSAT [very small aperture terminal].

1. INTRODUCTION

The first Dielectric Resonator Antenna was proposed by Eng Hock Lim and kwok wa leung in 2008.significant developments have been done in the field of dielectric resonator antenna over the last three decades the investigations performed by researchers on dielectric resonator antenna dielectric resonators are made of high dielectric constant materials and have been used efficiently as microwave components in filter design because of their high quality factor. Therefore, many engineers have doubted their usefulness as radiators, thinking that they would not be efficient radiators and that they would have very small radiation bandwidth. It has been shown, however that some modes have a small radiation Q-factor.

DRAs geometries are cylinders of rectangular, circular, and elliptical cross-sections, and also, hemispherical shapes. Their resonance frequencies depend on the dimensions, geometry, and permittivity/losses of those ceramics. Moreover, the DRAs exhibit interesting characteristics for the design of antennas, such as reduced dimensions, low losses, low profile, high density of integration, and high radiation efficiency. Furthermore, it has low sensitivity at resonance.

It was believed that the bandwidth of the dielectric resonator antenna would be small because of the high dielectric quality factor but it was found that the radiation -factor is low for some low order modes. Several techniques have been proposed to further increase the bandwidth of the dielectric resonator antennas. An annular arrangement of the dielectric resonators can also increase the bandwidth [9]. It was found that when a tiny air gap (or equivalent very thin layer of very low dielectric constant material) exists between the ground plane and the high dielectric constant resonator, the resonant frequency shifts and the impedance bandwidth increases [9], [10]. This observation is also used to make a dielectric resonator of multi-layers of different dielectric materials that can also increase the bandwidth. This technique, however, requires a composite structure for the dielectric resonator that may not be easy to fabricate and control its accuracy.

2. CONICAL DRA USING HFSS

The Conical Dielectric Resonator Antenna is designed using High Frequency structured Simulator(HFSS) software and the antenna is made up of " TACONIC" and it's parameter proves that it is a best solution at these frequency compare to other shapes conical Dielectric resonator antenna is more efficient than micro-strip antenna.

As our Design is a mode based problem, we have taken the solution type as Driven model. All units in our project has taken in "mm" and it is fixed throughout the project we are sure that rescale to new units is cleared i:e the spacing between grids is constant.

Object name	Dimensions1	Dimensions 2	Material
Air volume	120mm(x-size)	120mm(y-size)	air
DRA	35mm	Height of 2mm	Taconic
Conical cavity	1.825(upper radius)&5.045(lower radius)	Height of 5.01mm	Arlon(1000)tm
Feed gap	3mm	Height of -1	
Annular ring	3mm		

Table1: parameters of Conical DRA

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Analysis of Conical Dielectric Probe is Used to Identify the Defective Skin Phantom

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ABSTRACT

The Conical dielectric probe (CDP) will be an effective method for analysis for mankind's tissue sickness like initial stage of skin cancer. This sick will be greatly treatable when skin cancers are distinguished initially and removed utilizing non-invasive skin tumor identification devices such as dielectric probes. To detect the dielectric probes, cancers could use a millimeter wave with of either 95 GHz or 35 GHz frequencies. This millimeter wave has a sensitive reflective response to water content in that it utilizes a method of identifying skin cancers. Such cancers have and parameter over that of healthy skin, and the probes spot cancers by recognizing these abnormal S-parameters utilizing COMSOL Multi physics software. Through experiment, evaluating the use of CDP and assure its protection as an optional for detecting the cancers of skin.

Keywords: *Dielectric Probe, Defective skin, COMSOL Multi physics, Heat transfer module, RF Module.*

INTRODUCTION

The COMSOL Metaphysics will be a cross-platform finite element analysis, Multi physics simulation software. The COMSOL gives unified workflow and IDE for chemical, mechanical, electrical, and fluid provisions. Alive link for MATLAB and API for java might a chance to be utilized to manage the software externally, and the same API is likewise utilized through the Method[1] Editor.

The COMSOL holds an App Builder that might be utilized to progress the independent domain- specific applications with custom user-interface. Clients might utilize drag-and-drop devices or programming. Particular offers might a chance to be included from the model or new offers might make presented through programming. It also holds a Physics Builder to make custom physics-interfaces available from the COMSOL desktop with the same look-and- feel as the built-in physics interfaces.

The COMSOL server [2] is the engine and software for running simulation applications and the stage for handling their distribution and deployment. Client formed applications could be run in COMSOL server through Windows-installed client. Svante Littmarck and Farhad Saeidi start the COMSOL in July 1986 at the Royal Institute of Technology (KTH) in Stockholm, Sweden. Numerous components are accessible for COMSOL, characterized according to the application regions, namely Fluid, Mechanical, Electrical, Chemical, Interfacing, and Multipurpose[3].

METHODOLOGY

The reaction of a millimeter wave with frequencies of 35GHz and 95GHz is known to be delicate to content of water. This method utilizes a low-power 35GHz ka-band millimeter wave and its reflectivity to humidity for non-invasive cancer analysis. Since skin tumors hold more humidity over healthy skin, it prompts stronger reflections on this frequency band. Subsequently the probe identifies abnormalities in terms of S-parameters during the tumor areas. A circular waveguide at the dominant mode and conically decreased dielectric probe are rapidly analyzed, alongside the probe's radiation [4] characteristics, utilizing a 2D hub symmetric model. Temperature variety of the skin and the portion about necrotic tissue dissection would likewise perform too.

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Advance Development of Warning Alarm System for Earthquake Using MEMS Sensor

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ABSTRACT

This present research paper proposes the earthquake warning alarm system sense the initial shaking of a main earthquake, trigger alarm system in advance of the mainly aggressive shaking. The caution framework that need been recommended for everywhere the universe might use a organize about advanced seismometers deployed around those state with provide for populated ranges up to each moment about development cautioning. The alerts might permit businesses, inhabitants Also state funded organizations run through with get primed. The reason for the investigation keeps tabs on the identification algorithm utilizing those gathered information choose on a quake is happening. That calculation will be versatile for nature Also will be dependent upon a probabilistic approach through a sliding window on boost the identification for occasions toward changing the likelihood for false alarms under an altered rate. At long last test outcomes would Gave demonstrating that that system will backing the needed execution with both simulated and genuine seismic jolts. A could be allowed development of the approach Might a chance to be actualizing geological remote sensor networks utilizing contemporary Smartphone for information procurement.

Keywords: *Earthquake warning system, Geological wireless sensor network, MEMS sensor, piezoelectric sensor, real-time seismology.*

INTRODUCTION

An earthquake consists from of large portions individual versatile waves. The working for EWS may be In view of the standard that the waves have voyaged from the epicenter to recombine at those recording site similarly as a work of their particular velocities, central distances, and proliferation ways. Body waves propagate inside a particular figure of rock Furthermore show up in the initial landing.

Seismic tremor happens because of that sudden demise arrival from claiming. Vast add up about vitality starting with those earths outside. Due to this vitality earth generates a few. Ruinous waves known as seismic wave. It need. Been discovered that those seismic waves incorporate shear wave, Longitudinal wave What's more surface wave [1,2]. Those Longitudinal wave and shear wave would otherwise call P-wave Also S-wave separately. Out for the sum waves. Surface wave may be those A large portion ruinous done nature, yet the. Velocity of the surface wave is slower over the opposite waves. The P-wave's vibration bearing and the. Forward movement need aid found with a chance to be same, which will be the. Speediest previously, nature "around those the greater part waves. However, the. Ruinous energy of P-wave may be found will be low. Those S-waves's vibration may be peroxide blonde of the ahead. Direction, whose velocity is easier over P-wave yet the. Ruinous drive is secondary.

This paper indicates the outline from claiming low expense quake alert framework which can make utilized toward the individuals in their home to spare their exists during those occasion when about quake. In the acceleration of the seismic wave will be more terrific over those predefined value, the framework blows those alarm[4,5]. This system can a chance to be utilized within multistoried fabricating Concerning illustration those alert is associated remotely indicated those The following structure.

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SDN in High Performance Computing for Scientific and Business Environment (SBE)

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Abstract—In recent scenario, need of computing is shifting towards High Performance Computing (HPC) not only for scientific applications but in commodity applications also. HPC cluster system allows HPC users to analyze and solve complex problems that are associated with large data size, such as big data simulation and big scale scientific simulation for quick analysis. It is highly required in the domain of science and industry for enhancing accuracy. Today, cluster system approach in demand for HPC systems rather than main frame system, cluster is a system of multi-core multiple computers interconnected in network. HPC apart from interconnect includes multiple standalone computers (PCs, Workstations, or SMPs) are based on processor technologies (like Intel, IBM P6, SUN SPARC etc.) , RAM, and motherboard architecture, further operating systems, middleware, parallel programming environments enhance it. In this paper, key factors like processor micro architecture(Ivy Bridge, Haswell), inter-core communication performance, inter-socket communication performance (Quick Path Interconnect) and inter-rack communication through 10 Gbps and Infinband's DDR and FDR performance and challenges are reviewed to improve and meet businesses need with incorporating Software Defined Networking (SDN) in HPC scenario.

Index terms—inter-core, inter-socket, QPI, inter-rack, infiniband DDR, FDR, SDN

I. Introduction

In present scenario, computing need is shifting towards High Performance Computing (HPC) not only for scientific applications but in commodity applications also, resulting immediate players as individuals/system integrators and Original Equipment Manufacturers (OEMs). HPC support researcher and developers to solve, analyze complex critical problems decision associated with large data, such as scientific simulation on large scale data size and types in the monarch of Scientific and Business Environment[30],[32]. Generally, these problems are used to solve by mainframe computers but currently due to large size of data having verity of sources that generate it, are big to compute and elongated to incessant results are seen on a commodity desktop computer or workstation so HPC has become an imperative technology and technique for large scale computations on big data. Today's HPC systems are integrated as a cluster system, which is a system of multiple interconnected machines in a switched network. Interconnect is the key of development and research for enhancing the performance of HPC cluster [31],[33]. The distributed and high-performance applications necessitate high computational power, high speed and bandwidth communication execution. In recent years, processor's micro-architectural development, the computational power of microprocessor increased in many fold in last few decades. Concomitantly, very low latency and very high bandwidth network interconnects are emerged. This is a optimistic trend for building high performance clustered computing environments by combining the computational power of commodity Personal Computing devices (Desktop, Laptop, Hand-held device) with the communication performance of high-speed network interconnect. HPC apart from interconnect includes multiple standalone computers (PCs, Workstations, or SMPs) are based on processor technologies (like Intel, IBM P6, SUN SPARC etc.) , RAM, and mother board architecture, further operating systems, middleware, parallel programming environments enhance it . In past few years, computation power of processors have been increased in many folds and nonetheless, need of low latency and high bandwidth interconnect has been realized and emerged to build high performance computing environment. Interconnection technologies play crucial role in improving price performance [17],[38]. Network adapters and switches connect nodes in a HPC cluster. At each node, a stack of communication protocol layer provides functional compatibility for inter-node communication mean while upper layers' protocols like MPI, PVFS, are made to take advantage of communication layer to endure user applications. One of the key challenges for a cluster designer is to selection of interconnects that best cope with the applications' communication requirements. Because applications can have very different communication characteristics, so meticulous knowledge of different interconnects and their performance are required, to know how they perform under these communication patterns [37] [38].

II. Ivy Bridge Micro-Architectural Features

Comparing with previous "tick phase" Sandy Bridge micro-architecture, Tock phase Ivy Bridge micro-architecture has few enhancements and it is the first to use Intel's Tri-Gate transistors. Xeon E7 v2 generation family supports up to 15 computing cores per chip without Integrated Voltage

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Implementation of Tunable True Random Number Generator Based on DCM

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Abstract: Random numbers are very important in current cryptographic frameworks, for example, scratch age, key generation, IT security items, keen cards, **and probabilistic calculations** and so on. Equipment based random number generators are broadly utilized. Cryptography calculations are actualized on field Programmable Gate Arrays (FPGAs). A large portion of cryptographic prerequisites must be fulfilled for the random numbers. Here in project, we design an exceedingly effective and tunable TRNG in view of the guideline of beat frequency detection, particularly for Xilinx-FPGA-based applications. The fundamental favorable circumstances of the introduced TRNG are its on-the-fly tunability through dynamic partial reconfiguration to enhance randomness characteristics. We demonstrate the scientific model of the TRNG activities and test comes about for the circuit actualized on Xilinx. The introduced TRNG has low equipment requirement and inherent predisposition eradication.

Keywords—*Digital clock manager (DCM), dynamic partial reconfiguration (DPR), field-programmable gate arrays (FPGAs), true random number generator (TRNG).*

I. INTRODUCTION

True random numbers and physical nondeterministic number generators become regularly increasing importance. Most of cryptographic systems (scientific, stochastic, and quantum), Monte Carlo estimations, mathematical recreations, numerical study, dynamic calculations, lottery, and so on, require random numbers. Now a day, true random numbers have the majority, basically essential in cryptography and their corresponding various applications toward our regular day to day existence: mobile communications, e-mail access, online installments, cashless payments, ATMs, e-banking, web exchange, purpose of offer, recharge cards, remote based systems, common digital security, appropriated influence matrix security (SCADA), and so on.

In cryptography, where because of Kerckhoffs' theory all parts of conventions be freely identified aside from a few covert (additional data) identified by the sender and the beneficiary only, unmistakably the clandestine keys must not be computable through a busybody, i.e., it should be irregular. True RNGs are generally developed with the end goal that the associations between bits are little—these are to be specific, for possibility of randomness. At times the substantial framework that is estimated is becomes "reset" to an fundamental state subsequent to creation of every piece keeping within mind the end goal to decrease autocorrelation. Consequently by and large just couple of most reduced request autocorrelation coefficients be considerable, preferably simply the earliest one, which is called autocorrelation as well as indicated with a. Here a lot of developments otherwise true random number generators and examine is tranquil getting movement, yet in our analysis this can generally order the current craftsmanship divided by four categories:

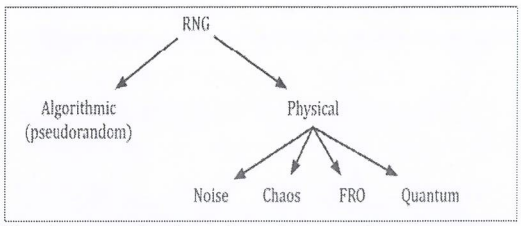

Fig. 1 categorization of random number generators

- Quantum RNGs
- Chaos RNGs
- Free-running oscillator RNGs
- Noise-based RNGs

The hierarchy of random number generators is illustrating in above Fig. Scientific pseudorandom generators are able to likewise exist partitioned into few classes relying upon the category of calculation utilized.

The significant obligation of this concise is the change the arrangement, in this we permits on-the-fly tunability of measurable characteristics for a TRNG with using DPR capacities of contemporary field programmable gate arrays in favor of changeable the modeling parameters of digital clock manager (DCM). Toward the greatest of our acquaintance, this can be main announced effort which allows tunability in a TRNG. This approach is pertinent for Xilinx FPGAs; it contains programmable clock generation instrument and competence of dynamic partial reconfiguration. The partial reconfiguration is

Design of Low Area Approximate Arithmetic Units for Video Encoding

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Abstract: The approximate computing is necessary and very much important in the image and video processing applications. The exact computing has attracted the researchers for video and image processing applications such as MPEG and JPEG. As they provide slight visual change in the output after compression, which makes the above said algorithms are more desirable. If we have used fixed hardware configuration, the output quality has not adaptive to input data. This is due to fixed approximation in the hardware. The degradation in the quality of the output can be overcome by varying the Degree of Hardware Approximation. If we take an example of an MPEG encoder, which has static hardware approximation, the output quality is degraded due to the outputs are not in the output quality bound. This can be overcome by automatic change of Degree of Approximation in the hardware depending on the input. Reconfigurable Arithmetic Units are most useful in changing Degree of Approximation In the Motion Estimation and Discrete Cosine Transform modules of the MPEG encoder. The Reconfigurable Arithmetic Units such as Ripple Carry Adder (RCA), Carry Look Ahead Adder (CLA) are designed to get better quality of the output videos, But they require more area, delay and execute the results at low speed. In this project we have implemented Kogge-Stone adder in place of Carry Look Ahead block to get better Speed, reduced Delay and area and Power consumption for compression scheme of An MPEG encoder.

Keywords: Approximate circuits, approximate computing, low area, low power design, quality configurable.

I INTRODUCTION

The controlled inaccuracy in the image and video processing algorithms, results in a slighter visual change in the output, which compression algorithms are the most attractive for approximate computing architectures. Approximate computing architectures accomplish the fact that a small relaxation in the correctness of the output can result in specifically simpler and low power implementations. Even though the most of the hardware architectures proposed so far suffer from the limitation that, the output quality degradation for dynamically changing input parameters. In that case, it is very difficult to provide a quality bound on the output, and in some of the cased, the quality of the output may be severely degraded. The main cause for this output quality variation is that the degree of approximation (DA) in the hardware architecture is static and cannot be personalized for different inputs. By using a conservative method, we can use a low DA in the configuration of the hardware, we can prevent the output accuracy degradation, so that the output accuracy is not much effected.

MPEG COMPRESSION

MPEG is the most popular video compression technique nowadays. By using the MPEG-2/MPEG-4 formats, the desired video can be squashed into very small sizes. Both inter frame and intra frame encoding are used by the MPEG. The Intra frame encoding encodes the entire frame of data, whereas the inter frame encoding uses the predictive and interpolative coding techniques for compression. The inter frame encoding exhibits the high temporal redundancy between adjacent frames and only encodes the variation between the frames, which results in better compression efficiency. In addition, motion compensated interpolative coding reduces the data further through by using bidirectional prediction technique. MPEG encoding contains three kinds of frames, they are listed below

1) I-frames (intraframe encoded);
2) P-frames (predictive encoded); and
3) B-frames (bidirectional encoded).

Each I-frame encodes the whole frame of data at a time, without loss. An I-frame precedes each MPEG stream of data. The P-frames are formed by the variation between the current frame and the immediately before I frame or the current frame and immediately before P frame. B-frames are produced among the

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Minimization Of Inter Carrier Interference Using Iterative Technique for Mimo-Ofdm

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Abstract – *In orthogonal frequency division multiplexing – multiple input multiple output (OFDM-MIMO) systems, in multipath fading channels the time period of an OFDM block is not constant. As a result, the sub-carriers lose their orthogonality and create intercarrier interference (ICI). Lot of research has been carried out to cancel or mitigate the effects of ICI in OFDM-MIMO systems but these methods are computationally complex. Here we use a low-complexity based frequency-domain algorithm to cancel the ICI created in time-varying multipath channels. Simulation with BPSK and QPSK demonstrates the performance of our algorithm in comparison to channels with ICI and no ICI. The results are also compared with zero forcing equalization algorithm which is the algorithm used presently in the OFDM-MIMO systems. Based on Fast Fourier Transform, iterative linear MSE has been implemented to maximize the output signal to noise/interference ratio in the MMSE estimates during iterative detection. It shows that 15 db signal to noise gain is achieved when bit error rate is* 10^{-9}.

Keywords: Time-varying multipath channels, Inter carrier interference (ICI), minimum mean square error, multiple- input multiple- output .

I. Introduction

In multipath fading channel, the received signal undergoes frequency-selective fading. If the symbol period is not too large as compared to the delay spread of the channel, the current symbol will affect the subsequent symbol as well. This process is known as inter-symbol interference (ISI). For a single-carrier system, as the data rate increases the ISI will also rise significantly. To avoid this problem multiple carriers are used for high rate data transmission. Multi-carrier systems can be regarded as a type of orthogonal frequency division

Multiple access (OFDMA) method as they transmit different symbols with orthogonal sub-channels in parallel form. The computationally efficient fast Fourier transform (FFT) is used to transmit data parallely over a large number of orthogonal subcarriers. OFDM-MIMO systems are being used in the latest generation of wireless mobile communications for achieving high-speed data transmission and efficiency. The subcarrier signals are overlapped in spectrum. As long as there is orthogonality between the sub-channels, there is no ICI thereby creating distortion less transmission channel. [1]

A guard interval is used before each transmitted data block to eliminate ISI. ICI may also occur if the length of the guard interval is shorter than the spread delay of the multipath channel.[2] Such ICI can be easily eliminated by copying the guard interval part of the next OFDM symbol and adding it to the head part of the current OFDM symbol as shown in figure 1.

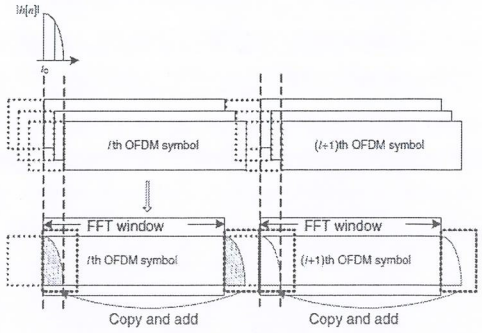

Fig 1 Copying and adding the guard interval of the next symbol into the head part of the current symbol to prevent ICI [3]

There are basically two types of noise created by the carrier signal – the phase noise and the carrier frequency offset (CFO). The CFO is caused by Doppler frequency shift in the multipath channel. The subcarrier frequency component is affected by other subcarrier frequency components and this also leads to ICI. Actually the CFO can be divided into two parts integer CFO (IFO) and fractional CFO (FFO). The IFO does not disturbs the orthogonality of the subcarriers and hence no ICI is created but in case of FFO, the orthogonality among the subcarriers is disturbed which leads to ICI. [4]

Traditional OFDM systems assume that the path remains static during the symbol duration. This even holds true if the symbol duration is much smaller than the spread delay of the channel. But in some high speed applications such as underwater acoustic channels, the channel will be changing its coherent time so fast that it is possible to have the symbol duration always lesser than it. In a time-varying channel if the OFDM symbol period is longer, then the orthogonality among the subcarriers at the receiver is destroyed and this creates ICI. This is especially true in case of fast fading

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Industry Fire Safety System using Embedded Technology with Internet of Things

Ch. Srigiri, K. V. Lalitha, T V Prasad, S. Krishna Vamsi

Abstract: ***This paper keeps tabs to the security also security of the article of clothing plant disappointments and outrage on his/her staff need getting to be a most amazing issue currently a times. Those articles of clothing plant workers face a considerable measure about issues and broken crazy of chimney a standout amongst them beyond any doubt. Those depositors aren't demonstrating to whatever enthusiasm toward this segment and fact that this division may be getting toner. In this examine a chimney identification system may be propounded and conjointly gives data of the area influenced. Here we utilized ARM7 which are inserted with diverse sorts from the sensors. We give acceptable connect verification system to Abstain from cautioning. The system could right away send a SMS of the admin. Those admin will verify or deny the data. If those admin verify softening out about fire At that point system could immediately raise an alert and SMS will a chance to be sent of the close-by blaze unit.***

Keywords: Fire safety, ARM7, ESP8266, sensors, authentication, GSM.

I. INTRODUCTION

Today's most recent advances need been being used for verification security. That home security includes a portion. Discriminating parameters like LPG gas spillage system,. Fire/smoke disturbing system, robbery & intruders. Checking device. A significant number complex publicizing systems. That would notwithstanding accessible for this end goal. Most recent. Controllers, sensors, feature cameras and boisterous buzzers. Need aid used to deliver these issues recently? Far reaching and more lapse spare frameworks would available,. Which need aid both exact and more cosset compelling. We need utilized ARM-7 Microcontroller. Which may be the mossy cup oak propelled processor from claiming today's. Innovation. In this task an endeavor may be made for those. "Design & advancement from claiming a ARM-7 based installed. System to home security. The produced framework employments. A Philips LPC -2148 streak programmable 16/32-bit. ARM-7 built microcontroller for the precision control. About different sensors. This will be automatic, compact, and reliable. Also low cosset system. That plan utilized within this one task. Could make executed will have home security which includes. LPG gas spillage alarming, fire/smoke disturbing and. Intruders disturbing framework.

An embedded system is a computer device which is the merger of software code and hardware devices to accomplish a specific function. The major devices used in this embedded devices are microprocessors and microcontrollers. It consists of specially made hardware devices built round a central processing unit (IOT). The software code is dumped into the microchip with the hardware devices.

Microprocessors are generally referred to as a general purpose inputs and give the output. When it comes to microcontroller, it accepts the information as inputs and additionally manipulates, interfaces the information and can be controlled and offers result finally. An embedded system can be a merger of hardware devices and code, and may be further mechanical or completely different modules which square measure designed to execute a particular perform. For example the appliances employed in the kitchen room are everything has one, and tens of voluminous the square measure used each day, however only a few devices processor and computer code square measure involved at intervals the preparation of their lunch.

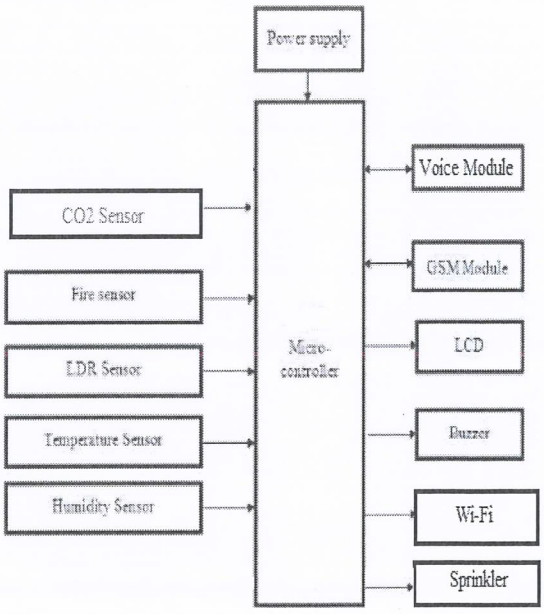

Figure.1.1 Block Diagram

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Analysis of Conical Dielectric Probe is Used to Identify the Defective Skin Phantom

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ABSTRACT

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Keywords: *Dielectric Probe, Defective skin, COMSOL Multi physics, Heat transfer module, RF Module.*

INTRODUCTION

The COMSOL Metaphysics will be a cross-platform finite element analysis, Multi physics simulation software. The COMSOL gives unified workflow and IDE for chemical, mechanical, electrical, and fluid provisions. Alive link for MATLAB and API for java might a chance to be utilized to manage the software externally, and the same API is likewise utilized through the Method[1] Editor.

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METHODOLOGY

The reaction of a millimeter wave with frequencies of 35GHz and 95GHz is known to be delicate to content of water. This method utilizes a low-power 35GHz ka-band millimeter wave and its reflectivity to humidity for non-invasive cancer analysis. Since skin tumors hold more humidity over healthy skin, it prompts stronger reflections on this frequency band. Subsequently the probe identifies abnormalities in terms of S-parameters during the tumor areas. A circular waveguide at the dominant mode and conically decreased dielectric probe are rapidly analyzed, alongside the probe's radiation [4] characteristics, utilizing a 2D hub symmetric model. Temperature variety of the skin and the portion about necrotic tissue dissection would likewise perform too.

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Advance Development of Warning Alarm System for Earthquake Using MEMS Sensor

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ABSTRACT

This present research paper proposes the earthquake warning alarm system sense the initial shaking of a main earthquake, trigger alarm system in advance of the mainly aggressive shaking. The caution framework that need been recommended for everywhere the universe might use a organize about advanced seismometers deployed around those state with provide for populated ranges up to each moment about development cautioning. The alerts might permit businesses, inhabitants Also state funded organizations run through with get primed. The reason for the investigation keeps tabs on the identification algorithm utilizing those gathered information choose on a quake is happening. That calculation will be versatile for nature Also will be dependent upon a probabilistic approach through a sliding window on boost the identification for occasions toward changing the likelihood for false alarms under an altered rate. At long last test outcomes would Gave demonstrating that that system will backing the needed execution with both simulated and genuine seismic jolts. A could be allowed development of the approach Might a chance to be actualizing geological remote sensor networks utilizing contemporary Smartphone for information procurement.

Keywords: *Earthquake warning system, Geological wireless sensor network, MEMS sensor, piezoelectric sensor, real-time seismology.*

INTRODUCTION

An earthquake consists from of large portions individual versatile waves. The working for EWS may be In view of the standard that the waves have voyaged from the epicenter to recombine at those recording site similarly as a work of their particular velocities, central distances, and proliferation ways. Body waves propagate inside a particular figure of rock Furthermore show up in the initial landing.

Seismic tremor happens because of that sudden demise arrival from claiming. Vast add up about vitality starting with those earths outside. Due to this vitality earth generates a few. Ruinous waves known as seismic wave. It need. Been discovered that those seismic waves incorporate shear wave, Longitudinal wave What's more surface wave [1,2]. Those Longitudinal wave and shear wave would otherwise call P-wave Also S-wave separately. Out for the sum waves. Surface wave may be those A large portion ruinous done nature, yet the. Velocity of the surface wave is slower over the opposite waves. The P-wave's vibration bearing and the. Forward movement need aid found with a chance to be same, which will be the. Speediest previously, nature "around those the greater part waves. However, the. Ruinous energy of P-wave may be found will be low. Those S-waves's vibration may be peroxide blonde of the ahead. Direction, whose velocity is easier over P-wave yet the. Ruinous drive is secondary.

This paper indicates the outline from claiming low expense quake alert framework which can make utilized toward the individuals in their home to spare their exists during those occasion when about quake. In the acceleration of the seismic wave will be more terrific over those predefined value, the framework blows those alarm[4,5]. This system can a chance to be utilized within multistoried fabricating Concerning illustration those alert is associated remotely indicated those The following structure.

A CONICAL SHAPED DIELECTRIC RESONATOR ANTENNA IN X-BAND

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Abstract: Here we have Designed a Conical shaped dielectric resonator (DRA) using HFSS which is radiating at X-band, Assigning the materials with Arlon, Tarconic. By taking solution frequency 4.3GHz, Maximum number of passes 20, Max delta per S 0.02,Frequency setup type as Linear Step ,Starting frequency set to 1GHz and End Frequency 20 GHz we have simulated our project. From the result it can be observed that the antenna resonates at nearly 11.788 GHz which comes under X-band and the antenna is useful in different applicant VSAT [very small aperture terminal].

1. INTRODUCTION

The first Dielectric Resonator Antenna was proposed by Eng Hock Lim and kwok wa leung in 2008.significant developments have been done in the field of dielectric resonator antenna over the last three decades the investigations performed by researchers on dielectric resonator antenna dielectric resonators are made of high dielectric constant materials and have been used efficiently as microwave components in filter design because of their high quality factor. Therefore, many engineers have doubted their usefulness as radiators, thinking that they would not be efficient radiators and that they would have very small radiation bandwidth. It has been shown, however that some modes have a small radiation Q-factor.

DRAs geometries are cylinders of rectangular, circular, and elliptical cross-sections, and also, hemispherical shapes. Their resonance frequencies depend on the dimensions, geometry, and permittivity/losses of those ceramics. Moreover, the DRAs exhibit interesting characteristics for the design of antennas, such as reduced dimensions, low losses, low profile, high density of integration, and high radiation efficiency. Furthermore, it has low sensitivity at resonance.

It was believed that the bandwidth of the dielectric resonator antenna would be small because of the high dielectric quality factor but it was found that the radiation -factor is low for some low order modes. Several techniques have been proposed to further increase the bandwidth of the dielectric resonator antennas. An annular arrangement of the dielectric resonators can also increase the bandwidth [9]. It was found that when a tiny air gap (or equivalent very thin layer of very low dielectric constant material) exists between the ground plane and the high dielectric constant resonator, the resonant frequency shifts and the impedance bandwidth increases [9], [10]. This observation is also used to make a dielectric resonator of multi-layers of different dielectric materials that can also increase the bandwidth. This technique, however, requires a composite structure for the dielectric resonator that may not be easy to fabricate and control its accuracy.

2. CONICAL DRA USING HFSS

The Conical Dielectric Resonator Antenna is designed using High Frequency structured Simulator(HFSS) software and the antenna is made up of " TACONIC" and it's parameter proves that it is a best solution at these frequency compare to other shapes conical Dielectric resonator antenna is more efficient than micro-strip antenna.

As our Design is a mode based problem, we have taken the solution type as Driven model. All units in our project has taken in "mm" and it is fixed throughout the project we are sure that rescale to new units is cleared i:e the spacing between grids is constant.

Object name	Dimensions1	Dimensions 2	Material
Air volume	120mm(x-size)	120mm(y-size)	air
DRA	35mm	Height of 2mm	Taconic
Conical cavity	1.825(upper radius)&5.045(lower radius)	Height of 5.01mm	Arlon(1000)tm
Feed gap	3mm	Height of -1	
Annular ring	3mm		

Table1: parameters of Conical DRA

DESIGN OF LATTICE HYBRID STRUCTURE BASED ON RENEWABLE POWER

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Abstract : In this paper, in context of the possible results of wind and sun filled vitality assets, a cream framework is proposed and rehashed to supply the electrical hugeness utilization of country space. Three conditions are picked and separated among those proposed by reenactment results and it is gotten a handle on that at a predefined fuel cost and ordinary wind speed, the blend system including wind turbines, diesel generators, batteries, and a converter is the most fitting circumstance. Moreover, affectability examination is performed and isolated to study the impact of likely vulnerabilities combining changes in the run of the mill wind speed and fuel cost. The outcomes of affectability examination reveal a couple changes in outline of the proposed system if there ought to be an event of fuel cost or typical wind speed assortments.

IndexTerms - **Hybrid System; Renewable Energy; Sensitivity Analysis; Homer.**

I. INTRODUCTION

Scattered period has many purposes behind essentialness influencing its resolutely opening up change and applications over the cross starting late years. The power era frameworks that utilization petroleum products or other non-inexhaustible assets are not generally viewed as ideal decisions in perspective of a few disadvantages including natural contamination and the expanding rate of fuel utilization and costs. Also, affectability examination is performed to review the impact of some likely dangers and potential collections joining changes in the wind speed and fuel cost. This is why their application has been largely increasing. Three circumstances are picked among those proposed by HOMER and are taken a gander at to the extent monetary and characteristic points. The affectability investigation performed in this work has distinguished the aftereffects of expanding possibilities of inexhaustible assets. Change and life cycle cost of a photovoltaic framework for thriving clinic in a country area has been contemplated and replicated utilizing HOMER programming. Then again, utilizing reasonable power source assets, for example, sunlight based and twist vitality to convey the electrical importance consolidates high capital expenses and low conviction due to the typical and climatic conditions. Particular and sensible examination of the coordination of hydrogen centrality advancements in sensible power source based remain solitary power structures has been investigated and assessed. Advancement and life cycle cost of a photovoltaic framework for wellbeing clinic in a rustic range has been examined and recreated utilizing HOMER programming.

A hybrid plan of photovoltaic-diesel battery and converter has been proposed for a provincial zone. Two distinct frameworks have been contemplated to supply the heap requests of a remain solitary country region and it has been inferred that incorporating hydrogen innovation, as vitality stockpiling medium, is a reasonable decision for this reason. Other affectability components, for instance, diesel cost and stature of wind turbine have in like manner been destitute down in this work. Four different renewable energy scenarios have been compared. Plausibility investigation of sustainable power source supply alternatives for a framework associated huge lodging in Australia has been performed and it has been reasoned that wind vitality-based capacity frameworks are desirable over photovoltaic frameworks. Specialized and sparing examination of the combination of hydrogen vitality advancements in sustainable power source based remain solitary power frameworks has been researched and assessed. For a remote town in India, four sustainable assets, specifically, little scale hydropower, sun powered photovoltaic frameworks, wind turbines and bio-diesel generators have been outlined.

II. PROPOSED SYSTEM

In the proposed system, while diesel generator and battery acknowledge the bolster part the photovoltaic and wind turbine are the doable power sources to cover the required load ask as show in Fig. 1. The parts sketched out this structure are photovoltaic bunch, wind turbine, diesel generator, battery, and converter. As demonstrated by the pile apex of the region under audit, a 1.5 MW and a 3 MW diesel generator are used. This structure should be able to do uninhibitedly giving the vitality demand of the normal zone under survey. Photovoltaic bunches, which are made of parallel photovoltaic sheets, change over daylight-based essentialness to electrical imperativeness. The utilized bend turbine with the reason for control of 100 kW AC is sensible for zones with similar climatic conditions. HOMER models the photovoltaic exhibit as a gadget that specifically creates DC current from daylight. Since the proposed framework is independent from the power network, diesel generator is utilized as a reasonable bolster unit to improve the framework unwavering quality.

In the proposed framework, the four 6CS25P batteries are used for every string are considered. Batteries support cost is considered as 10 $/year. Moreover, a converter with the proficiency of 90% is utilized to change over the created control from AC to DC and the other way around. As of now, diesel value estimation in Iran is 0.3 $/liter. Here the photovoltaic, wind turbines, and diesel generators are used to charge the batteries which give more energy for a long time. The determination s of every segment including capital cost, substitution cost, and lifetime are outlined in Table I: In the proposed framework, cycle charging procedure is utilized and the working store as percent of hourly load is 10% and sun based and wind control yield are 25%, and half, separately. These factors are diverse as for the number and limit doled out for every segment through which the reproduction is performed.

Velocity Control of Permanent Magnet (PM) DC Motor using LabVIEW

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Abstract : In this paper, the speed control of Permanent Magnet DC (PMDC) motor is performed utilizing Lab VIEW interfaced with Arduino. The advantage of utilizing Lab VIEW with Arduino is economy and is basic in structure. The other speed control strategies like FPGA technique, fuzzy control, utilizing 555 clock and PID controllers are having the disadvantage of entangled plan inclusion, inconsistent control, troublesome in the online monitoring with rapid motors. These downsides persuaded us to take a shot at Lab VIEW with Arduino. The outcomes demonstrate that the speed control of PMDC motor can be successfully performed with this setup. The speed control of servo motor and stepper motor should likewise be possible with a similar module. The use of speed control is required in robots used in home, crane operation, transport line operation, altering the direction of motor in forward and invert operation and so forth. Diverse interfacing programming like LIFA and LINX is utilized to interface Lab VIEW and Arduino.

IndexTerms **- Arduino Uno, DC Motor, LabVIEW, LIFA, LINX.**

I. INTRODUCTION

DC Motor is considered as a vital part in region of research, industry and lab tests in view of its effortlessness, ease and productivity [1]. Here in this paper, terminal voltage control strategy is utilized. Here we are attempting to control the speed and course of perpetual magnet DC motor utilizing the interfacing gadgets like Arduino with Lab VIEW. PWM based speed control of DC motor is done in [2]. Miniaturized scale controller AT89S52 has been utilized to create PWM pulses.555IC is likewise utilized to detect the speed of DC motor. The creators [3] propose a technique for speed control which utilizes LabVIEW and PID controller for controlling the speed of DC engine. It is accomplished by utilizing arduino board. Utilizing Data Acquisition board, the open circle speed control system is created in LabVIEW virtual condition. Arduino basically fill in as the interfacing gadget that digitizes approaching simple signs to advanced signs for LabVIEW to decipher it and interface with the given gadget [4]. These DC motor ends up in extensive variety of use concerning Home automation like by controlling bearing of the engine, we can without much of a stretch open and close the window drapes, entryways and so forth and by controlling and checking the speed of the engine in LabVIEW we discover its application in Rolling Plants, Overhead Cranes and Traction; drives for handling industry, Battery driven vehicles, machine instruments which require exact speed control.

II. BLOCK DIAGRAM

The program starting by making the while loop on the square chart and introducing the Arduino association with LabVIEW interface for Arduino sketch. The instruments required can be found in the Arduino palette. LINX is better a better package and LIFA package incorporate wide assortment of sensors and incorporate wide assortment of board that we can use for interfacing with LabVIEW. The motion controller acts as brain of the system by taking the desired target positions and motion profiles and creating the trajectories for the motors to follow.

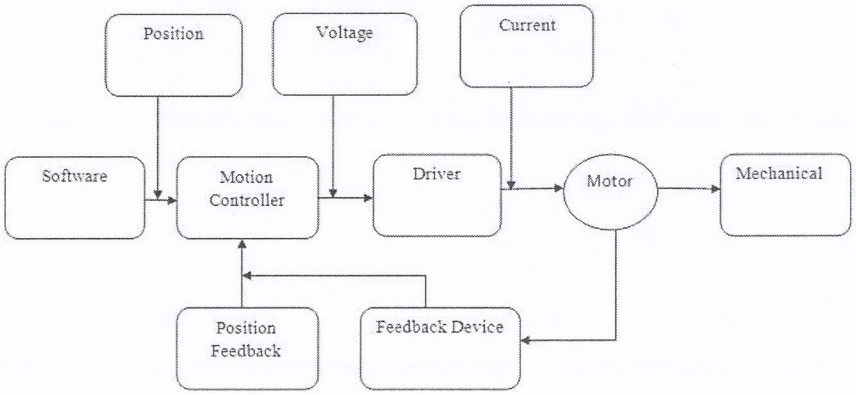

Fig. 1 Block diagram of motion control system

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Design of Hybrid LUT/MUX FPGA Logic Architecture for size Reduction and Performance Improvement in FPGA

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Abstract: Hybrid configurable logic block architectures for field-programmable gate arrays that contain a blend of LUT's and solidified multiplexers that are assessed towards the objective of higher rationale thickness and diminished region. Innovation mapping advancements that focus on the proposed models are likewise perform inside Xilinx programming. Both for complex rationale square and steering territory while keeping up mapping profundity, the named engineering of this paper examine the rationale size, region and power utilization utilizing Xilinx 14.5.

Index Terms: FPGA, CLB's, and Look up Tables, Multiplexers, and Fracturable Architectures.

I. INTRODUCTION

Half and half configurable rationale square structures for field-programmable door exhibits that contain a blend of query tables and solidified multiplexers are assessed toward the objective of higher rationale thickness and zone decrease. Innovation mapping improvements that focus on the proposed structures are likewise actualized inside ABC. Both representing complex rationale square and directing territory while keeping up mapping profundity. For factorable structures, the proposed design of this paper investigation the rationale size, zone and power utilization utilizing Xilinx 14.2. Since the commencement of field-programmable entryway exhibits (FPGAs), query tables (LUTs) have been the essential rationale component (LE) used to acknowledge combinational rationale. A K-input LUT is conventional and entirely adaptable—ready to actualize any K-input Boolean capacity. The utilization of LUTs streamlines innovation mapping as the issue is decreased to a diagram covering issue. Notwithstanding, an exponential zone cost is paid as bigger LUTs are considered. The estimation of K somewhere in the range of 4 and 6 is commonly found in industry and the scholarly world, and this range has been shown to offer a decent territory/execution bargain. As of late, various different works have investigated elective FPGA LE models for execution improvement to close the enormous hole among FPGAs and application-explicit incorporated circuits (ASICs).The MUX based rationale hinders for the FPGAs have seen accomplishment in early business designs, for example, the Actel ACT-1/2/3 models, and productive mapping to these structures has been examined in the mid 1990s. Be that as it may, their utilization in business chips has disappeared, Maybe mostly because of the simplicity with which rationale capacities can be mapped into LUTs, rearranging the whole PC supported structure (CAD) stream. By the by, it is generally comprehended that the LUTs are wasteful at actualizing MUXs, and that MUXs are as often as possible utilized in rationale circuits. To underscore the wastefulness of LUTs executing MUXs, think about that a six info LUT (6-LUT) is basically a 64-to-1 MUX (to choose 1 of 64 truth-table lines) and 64-SRAM arrangement cells, yet it can just understand a 4-to-1 MUX (4 information + 2 select = 6 data sources).

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II. LOOKUP TABLES

The basic system used to make a combinational method of reasoning square (CLB) furthermore called a justification segment in a SRAM-based FPGA is the inquiry table (LUT). As indicated by the underneath Fig, the inquiry table is a Static Random Access Memory and is used to execute a reality table. Each address in the SRAM addresses a combinational commitments to the method of reasoning part. The regard set away in the location addresses the estimation of the limit with respect to that data mix. A n-input work requires a SRAM with regions.
Since a fundamental SRAM isn't timed, the query table rationale component works much as some other rationale entryway as its sources of info changes, its yield changes after some deferral.

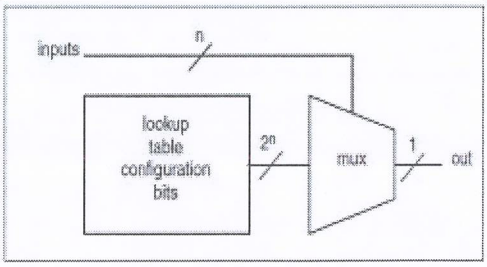

Figure -1Lookup Tables

III. PROGRAMMING A LOOKUP TABLE

Dissimilar to a run of the mill rationale entryway, the capacity spoken to by the rationale component can be changed by changing the estimations of the bits spared in the SRAM. Subsequently, the n-input rationale component can speak to capacities.
A reason part has four wellsprings of data.

DESIGN AND IMPLEMENTATION OF TESTABLE REVERSIBLE SEQUENTIAL CIRCUITS

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ABSTRACT: The structure of testable consecutive circuits by two vectors utilizing moderate rationale. The proposed consecutive circuits dependent on preservationist rationale outmaneuver the customary circuits constructed utilizing traditional gates as far as testability. Any consecutive circuits dependent on traditionalist rationale can test for stuck at 0 and stuck at 1 issue by utilizing two vectors 0 and 1. The structure of testable master-slave D flip-flop, Double Edge activated flip lemon(DET) flip-flop utilizing two vectors 0and 1 are introduced. The significance of the proposed work is that we are structuring reversible successive circuits appropriate for testing. Consequently both moderate rationale and reversible rationale is utilized. In the proposed work.We structure a reversible successive circuit utilizing Fredkin gate. Fredkin gate is the main reversible gate which bolsters both moderate and reversible rationale and furthermore having less quantum delay.

KEYWORDS: Conservative logic, Reversible logic, Fredkin gate, D Flip Flop.

I.INTRODUCTION:

Conservative logic could be a logic family that displays the property that there area unit equal numbers of 1s within the output as in that the input. Conservative logic it zero internal power dissipation that is an extra advantage to the present projected Technique. Changeability is that the property that shows matched mapping between input and output vector .Therefore the vector of input states. May be continuously reconstructed from the vector of output states. Reversible logic does not permit fan-out to occur .It means that for every input corresponding output is created. Therefore for one input multiple outputs doesn't seem to be possible.

This can be strictly restricted by reversible logic which ends up testing to be simple.Conservative logic is additionally known as reversible conservative logic once there is one to one mapping between input and output vectors along side the property that there area unit equal number of 1 s within the output as within the inputs.If a circuit is intended in associate in nursing irreversible manner then there will be a touch of knowledge lost and which ends up in chilling. The road of aaproach offered by conservative logic avoids variety of dead ends that the area unit found in ancient models and parades contemporary views.

According to landauer principle one little bit of info lost is equal KTln2 joules of energy lost,wherever K is the physical constant and T is the temperature during which operation is performed. Thus to scale back this energy lost fully we have a tendency to use reversible logic and additionally reversible logic fully reduces chilling. Reversible logic has received nice attention within the recent years because of their ability to scale back the heat dissipation that is the main demand in low power VLSI style.

Reversible logic takes care of Fan out draw back. It supports the method of running the system each forward and backward. The projected technique can beware of the fan-out at the output of the reversible latches and additionally disrupt the feedback to form them appropriate for take a look at solely 2 test vectors.all 0s and every one 1s. by this manner we will simply take a look at the circuit with ease in alternative words once circuit is dead in traditional mode. Feedback are going to be gift as a result of to complete the additional inputs. And equally once dead in take a look at mode its feedback is discontinuos and therefore the circuit is tested for stuck at faults. Thus projected technique is split into 2 modes traditional and take a look at mode. The projected technique is extended toward the planning of 2 vectors testable for DET flip-flops.

Reversibility in computing implies that no information regarding the machine states will ever be lost. Thus we will recover any past stage by computing backwards or un-computing the results. This is often termed as logical changeableness. The benefits of logical changeableness will be gained solely once using physical changeableness is much unacceptable. A circuit is claimed t be reversible if the input vector will be unambiguously recovered from the output and output assignments. That is not solely the outputs will be unambiguously determined from the inputs. However additionally the inputs will be regained from the outputs.

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Machine Learning Trained Face Recognition based Automotive Ignition System

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Abstract—**From the past few decades the percentage of individual transportation has increased from 39.2% to 77% globally, which shows a rapid growth in the sales of automotive, this also led to an increased rate of stolen vehicles and road accidents. This project aims to introduce an efficient and feasible methodology by implementing face recognition for improved security. The project incorporates image processing where the authorized user's facial features are recognized and verified with the database. Implementation of this system can be done on both motor bikes and motor cars with minimal installation cost which prevents the unauthorized use of vehicles. Keeping in mind the future perspectives, face recognition based automotive ignition system can surely provide a highly secure system thereby avoiding theft and ensuring passenger safety.**

Keywords—Raspberry-pi, Face Recognition, Ignition System, Open CV.

I. INTRODUCTION

Automotive theft and accidents are arguably the growing type of crime which are least-solved in our country. While a majority of stolen vehicles are motorcycles, scooters, cars and remaining are heavy vehicles like trucks. The use of Face recognition plays an important role in both security and surveillance which is already being used in different fields, its use and applications are rapidly spreading one of which is the implementation of Machine learning trained face recognition based automotive ignition system, which provides enhanced security and safety to both the user and vehicle.

II. LITERATURE REVIEW

In most Literatures Face Recognition and detection has been implemented using various platforms like mat lab, microprocessors, microcontrollers, FPGA etc. [1] They used Raspberry Pi based face recognition system using conventional face detection and recognition techniques such as Haar cascades. Their main objective is to replace the use of passwords and radio frequency identification cards to access high security systems and buildings with face recognition. [2] They have developed a network that consists a group of computers connected with a microcomputer with a camera that takes images of people, analyse, detect and recognize human faces using image processing and recognition algorithms, such a system can be used as security system in densely populated spots. It can detect and recognize an individual face in numerous situations and scenarios, because it makes use of "Boosted Cascade of Simple Features algorithm" to detect human faces. "Local Binary Pattern algorithm" to recognize these faces. Various other applications of face recognition have been mentioned in literature, [4] home automation using ARMv7 processors with Opencv library and face recognition algorithm based on principal component analysis (PCA). The main aspects of the system are low power consumption, resource optimization and enhanced operation speed.

III. METHODOLOGY

A. Training mode

Training mode, the module is first tuned to run this program where a set of random pictures of the user is captured and saved, these pictures acts like input data. The system makes use of Haar Cascade features and Local Binary Histogram pattern algorithm to train the module for efficient face recognition.

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ENCRYPTION AND DATA HIDING IN H.264 VIDEO STREAM

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Abstract - *Transmission of video over internet is prone to attacks from untrustworthy system and administrators. Hence it is necessary to perform encryption of video content for maintaining security of those contents. Data hiding in encrypted domain without decryption preserves the confidentiality of the content. For authentication and damage detection and covert communication, it is useful to embed secret information in these encrypted videos. A method is proposed where the secret information is embedded directly into encrypted video stream, thereby maintaining confidentiality of video content. The input video is compressed using H.264/AVC (Advance Video Compression) or HEVC (High Efficiency Video Coding encoder). This compressed video is converted into frames for the purpose of data hiding using codeword substitution and those encoded data hidden video is encrypted using DES (Data encryption standard) and random generated password. The codewords of residual coefficients, motion vector differences and intraprediction modes are encrypted using a stream cipher. Encrypted video along with encrypted file which contain password and frame number is send for storage or to receiver for decryption.*

***Key Words*: HEVC/AVC Video, Data hiding, H.264/AVC (Advance Video Compression), random generated password.**

1.INTRODUCTION:

In modern communication systems, there exists a diversity of applications with the coded video being an important part. Flexibility with regard to the application, efficiency of coding and robustness to channel changes are the most important features that are demanded from the video codec. H.264/AVC (Advanced Video Coding) codec meet these demands representing a solution for different multimedia systems. The PSNR has demonstrated to be a way to compute the perceptual quality of images. It is widely used because its simplicity and immediacy to be computed. This paper presents the measuring of the image quality of a video raw file (*.yuv) and encoded-decoded generated file compression system based in the H.264/AVC standard. These results have been compared and graphs have been shown with the quality measured by means of the traditionally used Peak Signal to Noise Ratio (PSNR). This paper measure quality of video which will encode & decode by H.264/AVC codec. However, an increasing number of services and growing popularity of high definition TV are creating greater needs for higher coding efficiency. Moreover, other transmission media such as Cable Modem, xDSL, or UMTS offer much lower data rates than broadcast channels, and enhanced coding efficiency can enable the transmission of more video channels or higher quality video representations within existing digital transmission capacities.

1.1 LITERARY SURVEY

Video encryption has been heavily researched in the recent years. This survey summarizes the latest research results on video encryption with a special focus on applicability and on the most widely-deployed video format H.264 including its scalable extension SVC. The survey intends to give researchers and practitioners an analytic and critical overview of the state-of-the-art of video encryption narrowed down to its joint application with the H.264 standard suite and associated protocols (packaging/streaming)& processes(transcoding/watermarking).H.264/AVC is a document published by the international standards bodies ITU-T (International Telecommunication Union) and ISO/IEC (International Organization for Standardization/International, Electrotechnical Commission).

As video file consist of several image sequence, so considering the data hiding technique of image will also apply for video data hiding. The most widely used technique to hide data is the usage of the LSB (Least significant bit modifications). Although there are several disadvantages to this approach, the relative easiness to implement it, makes it a popular method. To hide a secret message inside an image, a proper cover image is needed. Because this method uses bits of each pixel in the image, it is necessary to use a lossless compression format, otherwise the hidden information will get lost in the transformations of a lossy compression algorithm.

2. PROPOSED FRAMEWORK AND DESIGN

(A) Problem Definition:

Information hiding in encrypted media is a new topic of privacy-preserving requirements of cloud data

Performance Analysis of Different Classifiers in Speech Emotion Recognition

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Abstract- Recognition of emotion from speech signal is a new topic in present field of research, it has plenty of applications. One of the applications is Human machine interaction (HMI). The main objective of this research work is to develop Automatic -Emotion Recognition (AER) technique to recognize emotions in Telugu. It also compared the performance of different classifiers and developed a new enhanced method for the improved performance. Spectral features will consider only few feature vectors are not sufficient for emotion classification. To extract more feature vectors the DWT is used. The effect of Cepstral coefficients in the detection of emotions is performed and also a comparative analysis of Cepstrum, Mel-frequency Cepstral Coefficients (MFCC), and pitch on emotion classification is done. The classification task is performed using artificial neural network's back propagation algorithm. The proposed method has shown better performance in identifying four emotions from Telugu database that of other classifiers (GMM, Bayesian). Classification accuracy is improved.

Keywords- AER, DWT, MFCC, Cepstrum and Pitch, GMM, Bayesian, ANN.

I. INTRODUCTION

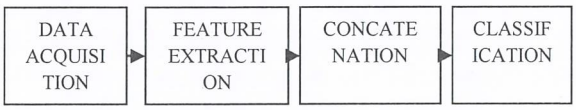
All forms of human communication carry information at two levels, the message and the underlying emotional state. Emotions are essential part of real life communication among human beings. Emotions are experienced when something unexpected happens at times. Emotion recognition is the process of examining or identifying the status of a person. The emotion recognition enable human computer or human machine interaction in future, which may possibly understand with persons or help people with communication tribulations and detection for psychiatric diagnosis, amongst other applications. Earlier research works have used different classifiers and feature extraction techniques and failed to improve accuracy and reduce misclassification. To enhance the accuracy artificial network with different nodes is deployed as classifier.

II. DATA BASE

Training and testing of the Artificial Neural Network is performed by using Telugu database. A male and a female speaker's voices of four different emotions namely neutral, angry, sad and happy are recorded. The database consists of 157 samples of both training and testing.

III. DISCUSSION

This section explains process involved in suggested method. The proposed method carried in five steps and is shown in following figure. Figure.1: Processing steps of speech emotion recognition



Data acquisition: The voice signals from different speakers are collected in this process; the data is collected so as to have four different emotions angry, sad, happy and neutral.

Feature Extraction: Spectral and prosody features are extracted using different methods. The techniques used to extract features involve DWT (Discrete Wavelet transform), Cepstrum, MFCC etc.

Concatenation: Features obtained from above process are concatenated to perform classification. The output of this process will produce a feature vector.

Classification: Classifier consider input vector and classify the emotion class based on trained data. Different classifiers used for emotion recognition

1. Gaussian Mixture Model
2. Bayesian Classifier
3. Artificial Neural network
4. Deep Networks

Gaussian Mixture model: Gaussian Mixture Models (GMMs) are among the most statistically mature methods for clustering or unsupervised learning. A Gaussian mixture model provides a good approximation of the originally observed feature probability density functions by a mixture of weighted Gaussians. Each emotion is modeled in one GMM. The decision is made for the maximum likelihood model. There are results in [11] where the authors concluded that using GMMs is a feasible technique for emotion classification.

Bayesian Classifier: Naïve Bayes classifier is based on the so-called Bayesian theorem with the naïve assumption of independence between every pair of features. This classifier in spite of the apparently oversimplified assumptions has worked quite well in many real-world situations. It is very fast and has

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PERFORMANCE INDICATORS OF RECTANGULAR MICROSTRIP PATCH ANTENNA

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ABSTRACT

Here we have tried to give a brief idea about the effect of different parameters such as length, height, width of the patch, the permittivity of different materials and frequency on the performance of Microstrip patch antenna. The impact of different materials on efficiency and effect of fringing field on micro strip line has also been discussed based on closed form formulas. The output is based on mat-lab code which has been generated through the mathematical formulas given by the various researcher

KEYWORDS: Microstrip Patch Antenna, Performance Indicators, Radiation-Efficiency & Fringing-Field

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Original Article

INTRODUCTION

Microstrip Antenna was first invented by Scientist Robert E. Bob Munson (1940-2015) from the United States in the year 1972. He invented and Developed numerous MPA for nearly all U.S Programs and convinced many customers to convert to Conformal MPA instead of protruding antennas and was awarded over 30 U.S. Patents. Basically, it is a printed antenna which operates at microwave frequency greater than 1GHz and became famous due to its small size, light weight, conformable to planar and non-planar surfaces, easy to design, easily fabricated on PCB and MCM etc... In recent trends of wireless-Communication patch antennas are used in almost all communication device for its ease of installation and fabrication. Even though microstrip antenna has lots of advantages it is having some limitation also-like low efficiency, narrow bandwidth, low RF power, not suitable for high-power applications, etc, hence lots of research going on to improve above parameters. As its name indicates it is having only one reference plane and consists of four parts such as Ground plane, Substrate, Patch and Feeder. The basic principle of operation of the patch antenna is that when it is excited at a resonant frequency, a strong field is set up inside the cavity, and a strong current on the bottom surface of the patch which produces significant radiation. For a rectangular patch, the length L of the patch is usually $0.3333\lambda o < L < 0.5\lambda o$, where λo is the free space wavelength. The patch is selected to be very thin such that $t << \lambda o$ (where t is the patch thickness). The height h of the dielectric substrate is usually $0.003\ \lambda o \leq h \leq 0.05\ \lambda o$. The dielectric constant of the substrate (εr) is typically in the range of $2.2 \leq \varepsilon r \leq 12$ [1]. Various factors directly affecting the performance of microstrip patch antenna. Ranjan Mishraet al presented an analytical study on the effects of different size and shapes of slots on the performance characteristic of UWB microstrip antenna [2]. Bikash Ranjan Behera et al projected the impact of different substrates on Rectangular Microstrip Patch Antenna' for different dimensions with differs in applications.

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Image Segmentation using K-means Clustering

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Abstract:

Clustering is the process of dividing the datasets or objects into groups, consisting of similar data points. Points in the same group are as similar as possible. Points in the different groups are as dissimilar as possible. K-means clustering is one of the popular algorithms in clustering and segmentation that is used to separate objects from the surrounding background. K-means clustering treats each feature point as having a location in space. The basic K-means algorithm then arbitrarily locates, that number of cluster centers in multidimensional measurement space. Each pixel in the image is then , assigned to the cluster whose arbitrary mean vector is closest. The procedure continues until there is no significant change in the location of class mean vectors between successive iterations of the algorithms. However, the K-means algorithm is very sensitive in initial starting points. K-means generates initial cluster randomly. When random initial starting points close to the final solution, K-means has a high possibility to find out the cluster center. Otherwise, it will lead to incorrect clustering results. K-means clustering is a partitioning method. The function K-means partitions data into k mutually exclusive clusters and returns the index of the cluster to which it has assigned each observation. Each cluster in the partition is defined by its member objects and by its centroid or center.

Keywords: K-means clustering,

1. Introduction

Image segmentation is one of the techniques most used to correctly identify the pixels of an image in a decision Application driven[1]. It divides an image into several distinct regions, so that the pixels are extremely similar In each region, and high regional contrast In several fields, it is a powerful resource like health care, image processing, traffic signal, pattern recognition etc[2]. There are various image segmentation techniques including threshold-based, edge-based, cluster-based, neural network-based techniques. One of the most effective approaches from the various techniques is the clustering approach. Once again different forms of clustering exist: K-means clustering, Fuzzy C means clustering, mountain clustering method and subtractive clustering[3]. But for various optimal cluster numbers it gives different cluster results[4].

Nowadays the segmentation of images is one of the essential medical techniques where it is used to isolate or area of interest from the context. Medical images are then segmented using various methods, and process outputs are used for further medical study[5]. But medical images are represented by the arrays of numbers in their raw form[6]. The number on the computer indicates the values of the relevant physical quantities showing the contrast between the different types of body parts[5]. Medical image processing and analysis are useful for converting raw images into a quantifiable symbolic form, extracting relevant qualitative information to assist in diagnosis, and incorporating complementary data from multiple imaging modalities[7]. And one of the fundamental problems in the medical analysis is image segmentation which identifies the boundaries of objects such as organs or abnormal regions in images. Results from the segmentation make it possible for shape analysis, detecting volume change, and making a precise radiation therapy treatment plant.

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Identifying the optimal Neural Network for Bone Fracture Detection

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ABSTRACT

The use of computer software to find flaws has become increasingly common in all industries nowadays. Quick detection and high accuracy are two characteristics of a highly responsive system, both of which can be accomplished by utilizing contemporary methodologies and making optimal use of available resources. Excessive external force that is more than the bone can bear is what causes a bone to break or crack. With the right neural network and deep learning, it is possible to automatically detect bone fractures, which can be of various forms and occur in various places, such as CNN, PNN, VGG, and InceptionV3 etc., This work's primary objective is to demonstrate the best neural network for bone fracture detection. Our study reflects that CNN is producing quickly and accurately than any other neural network utilized for processing when it comes to extracting the required data and processing on important areas of the images.

KEYWORDS: Bone Fracture, Deep Learning, Neural Network, CNN (Convolution Neural Network), PNN (Probabilistic Neural Network), VGG (Visual Geometry Group), InceptionV3, responsive systems.

1. INTRODUCTION

According to Japan, the epidemic of rheumatoid arthritis (RA), which affects millions of individuals around the world, is escalating by 30,000 every year. Joint erosion, contracture, and impaired joint function are all aggravating side repercussion of RA.The pathophysiology is optimized by monotherapy, but precise measurement of the incidence of RA recurrence and prenatal care are permitted. A hand- or foot-X-ray scan's conclusions are investigated to determine the pathophysiological mechanisms of RA. The erosion and joint space narrowing (JSN) of the 32 hand joints and 12-foot joints are adjudicated using the modified Total Sharp (mTS)score. Orthopedic specialists interactively award the 4 grades of JSN score and the 5 grades of erosion score to each joint. The predicted scores are incorporated to determine the order of RA. However, because there were so many points for inspection and

PERFORMANCE ANALYSIS OF MULTI MODAL FUSION AND CONVOLUTIONAL NEURAL NETWORK TECHNIQUES TO DETECT BRAIN TUMOR

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Abstract-Images from several medical imaging modalities, such as computed tomography (CT) and magnetic resonance imaging (MRI), are merged into one. Combining all important information from many pictures into a single fused image is the goal of image fusion (IF), a method for retaining critical information. In this study, a fusion of CT and MRI scans of the brain will be analysed to determine whether or not the results are normal. The abnormal component of the tumour site is pinpointed if the network is shown to be aberrant. Convolutional neural networks, the YOLOV2 architectural framework, and image processing methods are used to complete these tasks. We use the model's accuracy as a yardstick to judge the reliability of the experimental data.

Keywords: ***CT, MRI, CNN, YOLO***

1. INTRODUCTION

Unhealthy cells may form a lump, or tumour, in the brain. There are several subtypes of brain tumours. Both malignant and benign brain tumours exist (malignant). Primary brain tumours originate in the brain, whereas secondary brain tumours are the result of cancer that started elsewhere in the body and progressed to the brain. There is a wide range of possible rates of growth for brain tumours. How a brain tumour impacts your nervous system depends on its size and where it develops. Treatment options for brain tumours vary depending on the specific kind of tumour present, as well as the tumor's size and location.

Symptoms:

A brain tumor's symptoms may range from hardly noticeable to debilitating, depending on a number of variables such as the tumor's size, where it's located, and how quickly it's growing. A brain tumour may, but may not always, display the following symptoms: Blurred vision, double vision, and loss of peripheral vision are all examples of visual disturbances. Paralysis or lack of sensation or movement in one's arms or legs Disorientation and trouble communicating The headaches have a new or different pattern. Intractable nausea and/or vomiting Extreme tiredness, mental fog, hesitation, loss of impulse control, and changes in personality or behaviour may be signs. Disabled hearing The onset of convulsions, especially in people with no history of epilepsy Cancers of the brain, or primary brain tumours, originate in the brain or in tissues directly next to it. First appearing in the brain, primary tumours are caused by DNA abnormalities in normally functioning cells. DNA is the blueprint for a cell, including the instructions on how it should function. These

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IMAGE ENHANCEMENT IN LOW LIGHT CONDITIONS EMPLOYING ILLUMINATION MAP ESTIMATION

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Abstract-Low light images often exhibit colour distortion, fuzzy features, and poor contrast as a result of light scattering and attenuation in the water. In light of these issues, we present a low lightimage convolutional neural network (CNN) that uses structure decomposition for low lightimage improvement. In this case, theoretical analysis of the low lightimaging allows for the decomposition of the raw low lightimage into high-frequency and low-frequency components. Here, we provide a novel probabilistic approach to improving images by estimating both light and reflectance in the linear domain at the same time. Our results demonstrate that, compared to the logarithmic domain, the linear domain model is superior for representing background knowledge in order to estimate reflectance and illumination more accurately. The formulation is a maximum a posteriori (MAP) using previous knowledge about the lighting and the reflection. An asymmetrical multiplier

approach is used to compute illuminance and reflectance for the MAP issue. The experimental findings demonstrate the potential convergence rate of the suggested approach, as well as its good performance in

obtaining reflectance and illumination. The suggested approach produces findings that

are on par with or even superior to those obtained using other techniques of testing. The results of the ablation research prove that each component works as intended, and the results of the application tests show that the various approaches can produce high-quality photos in low light.

Keywords: LIME,CNN,Light image,HE,MAP.

1. INTRODUCTION

For the purpose of improving a picture, many enhancement strategies are utilised, such as grayscale modification, filtering, and Histogram Equalization (HE). One well-known method of improving images is called histogram equalisation. Because of how simple it is to implement, contrast enhancement quickly gained in popularity. In the second situation, generating artefacts that don't exist in the input

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Car Controlling with Hand Gestures

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ABSTRACT

The use of gesture recognition has long been seen as a solution to bridge the gap between the real and the virtual. The idea presented here introduces an Arduino-based automobile system that eliminates the need for human drivers. An Arduino microcontroller, Zigbee Module, alcohol sensor, and ultrasonic sensor are used to carry out the suggested job. Each hand movement creates values along its associated axis, allowing the driver to control the vehicle's direction just by moving their hand. The Gyroscope sends its readings to an Arduino UNO, which then sends commands to the motors. This concept has the potential to greatly benefit persons with mobility impairments by allowing them to relocate certain things with less strenuous physical actions. As a result, the automotive industry is seeing a proliferation of new technology and methods. As we are now well into the 21st century, advances in AI and the Internet of Things have helped to propel progress in all of these automotive-related fields. Formerly, robotic vehicles were operated by means of wired cables; this method had a number of problems, including a lower degree of compatibility and the fact that they were not able to benefit from Artificial Intelligence or the Internet of Things in practical settings like the military. In this work, we present the concept of a robot-car that can be driven by hand gestures, and we experiment with and show this concept. By analysing the hand's angle and location, the suggested robotic automobile may be driven with a wave of the hand. In addition, the Zigbee module allows the robot to be controlled with a single click on a smartphone running an android operating system and the use of speech recognition through Bluetooth technology. Arduino, a Gyroscope, an Ultrasonic Sensor, an L239d Motor driver IC, a Geared Motor and Connecting Wires, an Alcohol Sensor, and a Zigbee Module are all integral parts of the Vehicle's framework.

KEYWORDS: IoT, Zigbee Module, Gyroscope Alcohol Sensor.

1. INTRODUCTION

The term "Gesture Controlled Vehicle" refers to a vehicle that is operated not by conventional buttons but by the driver's hand movements. Hand gestures are innate to humans, and wireless technology makes them even more effective means of communication. Microcontroller project: a gesture-controlled automobile, whereby the driver directs the vehicle's movement with a hand glove. As opposed to conventional remote-controlled vehicles, this one is much simpler to converse with. You may drive it forward, backward, to the right, or to the left. When the hand is held parallel to the ground, the car comes to a halt. Arduino, Gyroscope, Ultrasonic Sensor, L239d Motor driver IC, Geared Motor, Zigbee Module, Alcoholic Sensor, Jumper Wires, and Connecting Wires all play important roles in the Vehicle's construction. A robot is a machine with intelligence that can be controlled remotely by a computer programme to carry out a wide range of tasks. Robots are crucial to

DETECTION OF DIABETIC RETINOPATHY USING DEEP LEARNING METHODOLOGY

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Abstract-Increases in its prevalence across the world have made diabetes a major killer. High blood sugar and insulin resistance are associated to a host of health problems, including cardiovascular disease, kidney failure, nerve damage, and diabetic retinopathy (vision loss). Diabetic retinopathy occurs when the blood vessels in the retina are compromised due to diabetes. At initially, either no symptoms appear or transient vision loss occurs. If left untreated, it may spread from one eye to the other, resulting in impaired or lost eyesight. The condition manifests itself when blood sugar levels rise to dangerous levels. Because of this, a diabetic is at very high risk for a wide range of problems. One advantage of early diagnosis is a reduced risk of developing complete and permanent blindness. Put another way, we need an efficient method of screening. A deep learning strategy is investigated here. We used a publicly accessible database to collect data on diabetic individuals for our analysis. The subsequent activity is to implement the pre-processing techniques. The system is completed by developing a machine learning and deep neural network (CNN) technique. The results of the experiments show that it is able to predict whether an input picture is normal or aberrant with a high degree of certainty.

.

Keywords: ***Diabetic Retinopathy, Deep Learning, KNN, CNN***

1. INTRODUCTION

Diabetes has been one of the most prevalent health issues worldwide in the last few decades. Possible complications of high blood sugar and an inappropriate reaction to insulin include cardiovascular illness, renal failure, neurological difficulties, and diabetic retinopathy (loss of vision). The damage caused by diabetic retinopathy might be permanent if not corrected.

A person's risk of having diabetes, whether type 1 or type 2, increases with age, and this is particularly true for individuals who have a family history of the disease. Worldwide attention is needed immediately for DR since it is a serious eye ailment, says the World Health Organization. In spite of the fact that 60 million people in India are affected by diabetic eye illness, only around 12,000 ophthalmologists are practising there.

Most people don't realise they have this disease, which is a big contributor to the shockingly high patient count. As worrisome is their apparent lack of concern for the propagation of this disease. Around 18% of diabetics also have DR, and the chance of DR development in a diabetic is 25 times greater than in a healthy person.

This condition is notorious for being misdiagnosed for a long time before it manifests itself clinically, since its early symptoms are typically nonexistent or mild. Consequentially, early diagnosis of DR is essential for preventing the development of the disease's consequences. A favourable

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Patient Health Monitoring System Using IoT and Machine Learning

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ABSTRACT

Smart cities are densely populatedurban areas that increase the usage of technologically advanced devices to reduce service wait times and false alarms. It allows long-distance precondition monitoring with help of integrated IoT-enabled embedded sensor networks. In the healthcare field, the usage of such advanced gadgets allows distant access monitoring and/or access management of ICU patients' health at regular time intervals. In recent days, personal IoT devices and gadgets are gained popularity due to their divergent services and ability to connect remote devices wirelessly. This present work discusses the usage of IOT- based devices for distance accessing of the event-triggered patient-specific clinical data collection (ETPSCD) that is needed for long- term data recording/monitoring/assessment of the condition of ICU patients at regular time intervals. Additionally, here in this work shows the effective usage of personal IOT devices that helps to allow conditional programming for automatic events that need to be executed without the need for a caretaker's physical presence in various emergency situations. The main objective of the project work is the development of interactive event-triggered patient health parameter monitoring and the design of a patient-specific datalogger system for long- term monitoring. In presented work mainly includes four stages: firstly, the project work uses two ESP8266 Modules, one of which is used to monitor the pulse and temperature and additionally provided with a patient Assistant key, and another module predicts the condition of a patient who is in a coma using Machine Learning. Secondly, the datacollected from the two modules are sent to thecloud and from the cloud to the Android Mobile App.

Finally presented work explains the efficient datalogger algorithm design for long-term patient monitoring and data recording applications. In the future, the presented project work further tested its robustness in complete cardiac signal delineation on resource-constrained devices and also its feasibility studied for event triggered-automated drug delivery.

KEYWORDS- Health Monitoring, Machine Learning Based Health Monitoring System.

1. INTRODUCTION

The Internet of Things (IoT) has revolutionized the way healthcare services are delivered to patients. IoT based remote patient health monitoring system with Machine Learning is a project that seeks to leverage the power of technology to improve healthcare outcomes. The project aims to use IoT devices to monitor patients' vital signs and other health parameters remotely. The data collected by these devices is transmitted to a cloud-based platform where it is analyzed and processed using machine learning algorithms. This allows healthcare providers to receive real-time updates on

A DANGEROUS GOODS X-RAY IMAGE IMPROVEMENT ALGORITHM FOR AIRPORT SECURITY INSPECTION

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Abstract-To resolve the problem of color distortion in CLAHE-enhanced airport security X-rays, we describe an approach that combines USM and CLAHE to further improve the quality of the original X-ray pictures. The X-ray image's R, G, and B channels will be used to generate grayscale pictures; these images will be upgraded using the CLAHE method; and finally, the enhanced R, G, and B grayscale images will be combined. The CLAHE-enhanced X-ray picture is then sharpened using the Unified Sharpening and Maximum (USM) algorithm, and the original and sharpened versions are blended together using the weight. Experimental findings demonstrate that the USM+CLAHE algorithm may effectively enhance the security X-ray picture while minimising color distortion.

Keywords: Airport security, X-ray image, USM, CLAHE, Image enhancement.

1. INTRODUCTION

Hijackings and bombs were the preferred strategy of subversive, militant groups throughout the globe in the 1970s, creating a headache for airlines and air passengers. While airport security has long been a top priority, many people were awakened by the 9/11 attacks to the hard fact that it wasn't tight enough.

In that day's events, guys with nothing more than box cutters turned four commercial airliners into flying bombs. What safety precautions may have prevented their success? What modifications have been made to airport security since then? Passenger aircraft carry 730 million passengers annually, and more than 700 million bags are searched annually for bombs and other dangers, as reported by the Department of Homeland Security. This article explores the employment of cutting-edge technology to ensure air travel is as risk-free as possible, and asks whether or not current measures go far enough. For a moment, put yourself in the shoes of a terrorist who is planning to either bomb or hijack an aircraft. Once entering the airport, you will be subject to metal detectors, bomb-sniffing dogs, and maybe a search of your belongings. How could you possibly get beyond all of those safeguards? A sensitive area of the airport could be reached by either climbing a fence or driving a truck through it.

This is why airports often use the most apparent forms of protection as a first line of defence, such as fences, obstacles, and walls. The whole airport grounds are enclosed by high barriers that would be

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Air Quality Monitoring and Prediction using IoT and Machine Learning Approach

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ABSTRACT

The air quality index number established by the government has been exceeded, indicating dangerously high levels of pollution in today's major cities. A person's health is significantly impacted by it. Using iot and machine learning techniques, we created a model to track and foretell the air quality index in a given area. In order to keep air quality at a high standard, a system is in place to gather data on pollutants from a designated area utilising IOT (microcontrollers, sensors, and the like). Data is gathered with the help of an Arduino Uno microcontroller. Meanwhile, the dataset is sent through server using a device called Node MCU that has Wi-Fi capabilities. The dangerous contaminants in the air are detected using a variety of sensors, including the MQ135, MQ5, MQ2, and DHT11 sensor. While trying to determine the quality of the air in a particular area, Machine Learning (ML) combines statistical analysis and computational modelling to provide the most accurate predictions possible. Among the components of an Internet of Things–based air pollution monitoring system is a MQ Series sensor interfaced to a Node MCU fitted with an adapter to transmit the sensor reading to a Thing Talk cloud. With the use of gathered data on pollutant concentration, our model will be able to effectively monitor and forecast the air quality index of any enclosed zone.

Indicating the pollution levels during a certain time period, the Air Quality Index of India is a commonly used metric. For individuals to take preventative steps against air pollution, this technology provides forecasts of pollution levels.

KEYWORDS: Air Quality, IoT, Node MCU, WIFI

1. INTRODUCTION

Air pollution is one of the most pressing issues of our day. India, the fastest-growing industrial country, is responsible for a staggering increase in the global total of airborne pollution. The fast expansion of the global economy has led to a surge in industrial production, which in turn has increased air pollution. Pollution from industry is a major contributor to the worldwide environmental crisis that threatens all forms of life, including human beings. Air pollution may be caused by both gases and solid particles including dust, pollen, and spores. Combustion of natural gas, coal, and wood, as well as industries, automobiles, and other sources, releases a variety of air pollutants such as carbon monoxide, carbon dioxide, nitrogen dioxide, sulphur oxide, chlorofluorocarbons, and particulate matter, all of which contribute to air pollution. Breathing in polluted air causes several health issues, especially in the lungs and respiratory system, if exposed to it for lengthy periods of time.

If you want to know how much of a toll pollution is taking on a certain area, you may look to the air quality indices that have been developed in accordance with the Indian Air Quality Standard. There are a variety of

Adaptative Laplacian NLM Technique for Video and Image Deblurring

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Abstract-This paper proposes a video picture Adaptative Laplacian NLM Technique to address the issue of blurred digital video, where in inter-frame information is easily lost and spatiotemporal is ignored during restoration. Here, we apply the denoising engine's adaptive Laplacian regularisation term to the process of restoring video images. First, we show that non-local means (NLM) regularisation is effective in extracting redundant information about the self-similarity of video images, and we provide a novel restoration model that combines many regularizers, most notably the NLM regularizer and the denoising regularizer. We employed a basic gradient descent technique to solve the video picture restoration model. In experiments, we find that our technique effectively removes blur and is surprisingly resistant to noise.

Keywords: NLM, Video Image, Laplacian regularization,LSB.

1. INTRODUCTION

In this study, we find that noise and blur are the most prevalent picture degradation issues in the contexts of both short video and public security surveillance [1]. Over the

past few decades, many different image restoration techniques have been developed, primarily using regularisation technology to add appropriate constraints to the original ill-conditioned problem, transforming it into a benign problem that can be solved in order to realise image restoration. Examples include the TV regularisation [2] and the wavelet regularisation [3] techniques. It's important to remember that picture denoising method performance tends to the limit in contrast to other image restoration issues. The ability to effectively implement a denoising technique to address additional picture restoration issues becomes crucial. In [4], [5], a plug-and-play approach is presented, which splits up the picture restoration inverse issue into individual image denoising jobs and then iteratively applies each one. It was suggested by Romano Y [6] to use the denoising function to build an adaptive Laplace regularisation function, and to use this function to build a new regularisation term by imposing constraints on the inner product of the input image and the denoising residuals. This approach offers a robust model foundation

HDR IMAGE RECONSTRUCTION USING IMAGE PROCESSING

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Abstract-A high dynamic range (HDR) picture may be created from a low dynamic range (LDR) shot, potentially providing an accurate depiction of the surroundings without the need for expensive tools. Recent advancements in deep learning have opened up new possibilities for HDR photography, including a degree of realism and complexity previously unattainable. To create an HDR image with similar dynamic ranges, this research presents a deep learning method for extracting the dark and bright portions of the input LDR photo. It is possible to create an HDR image using the proposed multi-stage deep learning network by combining characteristics with varying degrees of brightness, which are subsequently amplified in bright areas and muted in dark ones. By separating the LDR image into its bright and dark areas, a genuine HDR picture with natural colours and tones may be recreated. Overexposed and underexposed data may be blended more smoothly using this strategy. The experimental results show that the proposed method improves the parametric value over the state-of-the-art methods. The suggested method generates images that are almost as high-quality as the originals..

Keywords:LDR,HDR,Deep Learning,CNN.

1. INTRODUCTION

HDR images are capable of capturing the full range of lighting, contrast, and details seen in natural scenes. The sensors of inexpensive digital cameras are just not capable of producing photographs with a wide dynamic range. Blending several long-exposure range (LDR) shots recorded at different exposures is the most common approach to generating HDR photographs. Ghosting is a common issue when using handheld cameras or in dynamic scenes, despite the fact that this technique works well for still shots. Additionally, there are situations when taking many shots of the same scene is impossible. Single-image The purpose of high dynamic range (HDR) reconstruction is to recover an HDR picture from a single low dynamic range (LDR) input. A big part of the problem is that there isn't enough or too little information on the situation. Several methods have emerged lately that employ deep convolutional neural networks to generate an HDR picture from a single LDR source. HDR (32-bit) pixels have a lot more variance than LDR (14-bit) pixels, which makes it hard to learn a straight mapping between the two (8-bit).

REMOTE BASED HEART RATE DETECTION THROUGH EULERIAN MAGNIFICATION OF FACE

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Abstract-In this study, we develop a method that combines spatial and temporal analysis to draw attention to subtle shifts in a video. Media such as photographs and films may provide us fascinating insights into the process of change across time. It is necessary to enhance the subtle changes in behaviour that occur in videos since they are too subtle to be noticed by the naked eye. The human visual system has limited spatial-temporal sensitivity and visualisation capabilities outside of a narrow frequency range. This little variation may be used to detect a human pulse. Using a method that combines spatial and temporal analysis, we offer a system that can detect a person's heart rate by amplifying the effects of minute changes in the skin. Research in this area has much of space to grow; in the last several decades, it has contributed not only to the medical profession, but also to other areas of engineering and real-world applications like security.

Keywords: Eulerian, Heart Rate, Data Visualization, Human body..

1. INTRODUCTION

When it comes to people's health, the advancement of information technology has made a huge difference. Telemedicine, electronic health systems, and biomedical imaging have all benefited from it recently.

Internet-based healthcare delivery systems provide novel avenues for obtaining healthcare resources such as drugs, data, and financial backing. Utilizing this, we can keep tabs on people's health at all times and sound the alert if we detect any abnormalities. The time savings and improved ability to track human health are obvious results. Because of these two immeasurable benefits, the adoption of E-Health systems is rising in countries all over the globe. Use e-health or mobile health systems to monitor the patient's heart rate or assess their health without making a doctor's appointment. We can now respond more quickly to cardiac emergencies, give better treatment, and raise the alert in the case of danger.

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Military Surveillance by Using Drone

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ABSTRACT: The use of drones for military surveillance has become increasingly prevalent, with unmanned aerial vehicles (UAVs) being used to monitor and collect intelligence in both domestic and foreign territories. To ensure secure and reliable communication between the drone and the ground control station, it is important to use advanced communication technologies. Two such technologies that have proven to be effective for military drone surveillance are frequency-hopping spread spectrum (FHSS) and direct-sequence spread spectrum (DSSS). But by combining these two technologies it leads to an advanced technology known as Dynamic Hybrid Spread Spectrum (DHSS). It consists of a mixture of the above-mentioned technologies. FHSS and DSSS are both methods of transmitting data over a radio frequency that helps to reduce the risk of interference and ensure secure communication. FHSS rapidly switches the frequency of the radio signal, making it difficult for an attacker to intercept and decipher the data. DSSS, on the other hand, spreads the data across a wider frequency range, making it more difficult to jam or interfere with the signal. Our motive is to enhance the DHSS technology in military drone surveillance which is critical for ensuring secure and reliable communication, protecting sensitive information, and mitigating the risk of hacking and interference. This technology play a vital role in ensuring that military drone surveillance can be conducted safely and effectively.

KEYWORDS: Dynamic Hybrid Spread Spectrum (DHSS), secure communication, intercept and decipher the data, mitigating the risk of hacking and interference.

I. INTRODUCTION

Military surveillance refers to the monitoring and observation of potential threats to national security and military operations. It involves the use of various technologies, such as aerial and ground-based surveillance-systems, satellites, and communications intercepts, to gather information and provide real-time situational awareness. The objective of military surveillance is to enhance operational readiness, protect military assets and personnel, and gather intelligence to support decision-making. It plays a critical role in ensuring national security and protecting against potential threats. Drones, also known as Unmanned Aerial Vehicles (UAVs), have revolutionized the way military organizations carry out surveillance and intelligence-gathering operations. With their ability to fly long distances, reach high altitudes, and remain undetected, drones have become an indispensable tool in modern warfare. However, the use of drones for military surveillance has also sparked a debate about privacy, government overreach, and the ethical implications of these advanced technologies. It allows military organizations to gather intelligence in areas that are too dangerous for human troops to enter. This can be particularly useful in situations where there is a threat of terrorism or insurgency, as drones can fly over these areas and collect information without putting any lives at risk. Additionally, drones can also fly for extended periods of time, providing military organizations with real-time surveillance of their targets. This can be especially useful in situations where time is of the essence, such as in search and rescue missions or military operations.

Military use of drones for surveillance has become increasingly prevalent in recent years. Drones, also known as unmanned aerial vehicles (UAVs), can fly over large areas and collect a vast amount of data, making them useful for a variety of military purposes, including reconnaissance, surveillance, and target acquisition. The military has found that drones are much more effective than manned aircraft for many of these tasks, as they can stay aloft for longer periods of time and are much less expensive to operate. They are also much harder to detect and shoot down, making them ideal for missions in hostile environments.

While the use of military drones for surveillance has many benefits, there are also concerns about their impact on privacy and civil liberties. Critics argue that drones have the potential to be used to monitor individuals and groups without their knowledge or consent, violating their rights to privacy. Additionally, drones have been known to cause accidents, and there are concerns about the potential for them to be used for malicious purposes.

Another concern is the accuracy of the information that is collected by drones. While the technology has advanced significantly in recent years, there is still the potential for error and misinformation. This is particularly true in situations where the drones are being operated in areas that are difficult to navigate or where the data is being interpreted by individuals who are not trained in the use of the technology.

To address these concerns, many countries have enacted regulations to limit the use of military drones for surveillance. These rules require that drones be operated in accordance with safety guidelines and that they not be used to collect information about individuals without their consent. In India, the use of military drones for surveillance is regulated by the Ministry of Defense and the Directorate General of Civil Aviation (DGCA).

The Indian military uses drones for various purposes, including border surveillance, intelligence gathering, and disaster management. In recent years, the Indian government has increased its investment in military drone technology and has implemented various measures to enhance their use for national security.

An Optimal Design Method for All-Optical Universal Gates Based on Metal-Insulator-Metal Waveguide

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Abstract-The group of universal gates known as optical universal gates may be used to build any optical logic gate. According to conventional wisdom, there are only two types of logic gates: NAND and NOR. In this study, we introduce a Mach-Zehnder Interferometer structure made up of two plasmonic components, and describe its use in the construction of universal gates. Mach-Zehnder interferometers are constructed using metal-insulator-metal waveguides. The proposed arrangement works at a wavelength of 1.55 micrometres. The size of the planned optical universal gates has been lowered to 18.50 micrometer * 8 micrometer in order to further previous work. The optical Nand gate significantly reduces insertion loss, with a 0.669dB result, compared to previous efforts. A lower insertion loss of 0.791 dB for an optical NOR gate is a better illustration of the enhanced performance. The OptiFDTD programme is a simulator for optical universal gates that use the finite-difference Time-domain modelling technique. The recommended design is then investigated further using the results from the S-Edit simulation.

Keywords: Metal-Insulator-Metal Waveguide, Mach-Zehnder Interferometer, optical logic gates, S-Edit simulation, OptiFDTD simulator

1. INTRODUCTION

1.1 Introduction on Finite-Difference Time-Domain

Finite-Difference Time-Domain allows photonic components to be designed and built entirely in a computer, without the need for any prior training or expertise. Using Finite-Difference Time-Domain is helpful in the design, analysis, and testing of state-of-the-art nonlinear and passive photonic components. Boundary conditions in Optiwave FDTD are complex, for example the Uniaxial Perfectly Matched Layer (UPML). Full-vector differential version of Maxwell's coupled curl equations may be used in FDTD to solve electric and magnetic fields in time and space. By definition, FDTD does not limit what kinds of materials may be used in the devices. Today, design engineers may be more productive, and products can be built and brought to market in less time, thanks to automation of these processes.

Many different types of materials are available in FDTD simulations, including perfect conductors, lossless materials, lossy materials, isotropic materials, anisotropic materials, multiple resonance dispersive materials, Lorentz-Drude materials (noble metals and surface plasma), 2nd-Order and

IMPACT OF PRE-PROCESSING TECHNIQUES ON FULL REFERENCE IMAGE QUALITY ASSESSMENT

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Abstract-Natural scene photography makes up the bulk of digital photos used in multimedia presentations (NSIs). All NSIs are recorded using real-world cameras. Metrics for objectively evaluating image quality fall into one of three categories: full reference (FR), reduced reference (RR), or no reference (NR). We are basing our work on complete reference metrics for this undertaking. Metrics for evaluating the quality of natural-scene photographs are the focus of full reference image quality assessment (FR-IQA). By contrasting a reference and distorted/test picture, FR-IQA may provide an objective prediction about the perceived quality of the latter. Objective ratings from the techniques themselves are compared with subjective evaluations offered in common image databases used for IQA to determine how well FR-IQA methods perform.The FRIQA measure is tested using a database maintained by the Laboratory for Image and Video Engineering (LIVE). The database has reference photos from which several distorted images were generated using a variety of distortion techniques. A subjective rating is assigned to each deformed picture. Each deformed image's objective score must be calculated, and relationships between objective and subjective ratings must be determined, before an evaluation can be made. To that end, we propose to apply several image pre-processing methods to the database and measure their effect on baseline FR-IQA algorithms. In addition, we'd suggest picture enhancement methods specific to the distortions present.

Keywords:Images Quality,FR-IQA,NSI,HVS..

1. INTRODUCTION

Every picture has some degree of distortion. There are several kinds of distortion. Such things as noise, blur, and altered contrast are examples. These aberrations may drastically diminish the image's overall quality. Distortions in the acquired picture would make it seem different from the source. Understanding the visual quality there is crucial. The quality of a picture is often evaluated based on subjective ratings[1]. People were asked to assess the perceived quality of the images. Even though subjective findings may be reliable, collecting them is a tedious and expensive procedure. Therefore, scientists have had to create objective image quality assessment algorithms (IQA)[2] to provide accurate quality predictions automatically. Numerous image compression techniques and other image processing applications can use these image quality measurements. By doing so, we may determine whether the image has any distortions. By assessing the quality metric value, it is possible to determine whether there has been any decrease in image quality. We can replace the distorted image with a more accurate one

MULTIPLE PERSONS HEART RATE DETECTION THROUGH IMAGE PROCESSING OF LIVE FACE

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Abstract- Multi-person heart rate measurement from webcam is a novel and emerging research area that involves the use of computer vision and signal processing techniques to extract heart rate information from video data captured using a webcam. This paper provides an overview of the existing research on heart rate measurement using cameras and proposes a new methodology for multi-person heart rate measurement from webcam. The proposed method uses image processing techniques and signal processing algorithms to accurately extract heart rate information from video data captured from multiple individuals. The evaluation results show that the proposed method achieves medium accuracy and robustness in measuring heart rates of multiple individuals under various conditions. This research has important implications for healthcare, sports, and other fields where real-time heart rate monitoring of multiple individuals is required. Future research can focus on addressing the challenges and developing more robust and accurate methods for heart rate measurement using cameras

Keywords: Multiple Persons Heart Rate, Data Visualization, Human body.

1. INTRODUCTION

Heart rate is an essential physiological parameter that provides valuable information about a person's health and fitness level. Traditionally, heart rate measurement involves the use of invasive or semi-invasive techniques, such as electrocardiography (ECG), pulse oximetry, or blood pressure monitoring. However, these methods are not always practical or convenient, especially in settings where continuous or non-invasive monitoring is required. In recent years, the use of cameras for non-contact heart rate measurement has gained significant attention due to its non-invasive and convenient nature.

Multi-person heart rate measurement from webcam is a challenging problem that involves tracking multiple individuals and dealing with motion artifacts and variations in lighting conditions. The use of cameras for heart rate measurement offers several advantages over traditional methods, including non-invasive and remote monitoring, continuous and long-term monitoring, and the ability to monitor multiple individuals simultaneously. These

A REAL TIME AIR QUALITY EVALUATOR USING IOT

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Abstract-Air pollution has now become the most critical environmental health problem on a global scale. Human health, the environment, and climate are all negatively impacted by air pollution. The increasing concentration of dangerous gases and particulate matter in the atmosphere, as well as the poisonous gases generated by industrial and automobile emissions, contribute to air pollution. Breathing in polluted air can lead to a host of health issues, including issues with the heart and blood vessels and the skin. There is a growing awareness of the need of air quality monitoring now that air pollution has emerged as one of the greatest environmental health risks. There has been a dramatic increase in the availability of real-time data on air quality.

Keywords:Air Pollution, IoT,NodeMCU,GSM.

1. INTRODUCTION

As there is a rise in the concentration of dangerous gases and particulate matter in the atmosphere due to the production of poisonous gases by industry, automobile emissions, and other factors. Factors such as industrial production, urbanization, population growth, and increased automobile usage are contributing to a sharp rise in pollution levels. There are several factors that contribute to rising levels of air pollution, but one of the most crucial is

particulate matter. There is a pressing need for continuous, high-precision monitoring of air quality so that effective measures may be made as soon as possible. In this study, we provide an independent, real-time method of measuring air quality. Our approach for monitoring air quality relies heavily on the Internet of Things (IoT), which is now being used in almost every industry. Under the scope of this IoT project, we have the ability to monitor pollution levels remotely through computer or mobile device. The term "Internet of Things" (IoT) is used to refer to the interconnected network of "things" that include electronics, software, and other technologies for the purpose of communicating and exchanging data with other devices and systems online. Appliances may vary from the common place to the highly specialized. The Internet of Things (IoT) has emerged as a powerful technology for monitoring and evaluating air quality. It will utilize a network of IoT sensors to collect data on various air quality parameters such as particulate matter (PM), carbon dioxide (CO2), nitrogen dioxide (NO2), and ozone (O3). By using IoT sensors, it is possible to collect and analyze data on air quality in real-time, enabling authorities to make informed decisions

A NOVEL IMAGE CRYPTOGRAPHY USING UES

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Abstract

In this paper, an image encryption method using Ultramodern Encryption Standard (UES) is envisioned. In this method, the encryption key is spawned by prolic series and then the original image is encrypted using the UES cryptosystem. This approach not just decreases the time complexity of the algorithm yet additionally adds the confusion and diffusion capacities, which makes the encrypted pictures developed by the UES approach resistant to the differential assaults. The key space of UES cryptosystem is large enough to fight the brute-force attacks. This approach is so subtle to the initial values and input picture so the little changes in these values can prompt critical changes in the encrypted picture. The model results depicted in the further sections ensures that slight changes in original image and key could result significant changes in the encrypted image and finally the original image cannot be accessed.

Keywords: UES, Cryptosystem, Encryption, Decryption, Image Encryption, Prolic Series

1. Introduction

The outright developed digitalization in recent days is playing a fundamental role in digital image transmission viz., legislature, medical, military, banking, finance sectors. In transferring such critical pictures across the digital transmission medium may sometimes get under the control of the intruder who can tamper its contents and may lead to declination of war, wrong treatment etc... in military and medical sectors respectively. Securing such significant images is possible through image encryption. Hence a high end image encryption technique with low time complexity is to be applied. In preference transmission of images between sender and receiver has to be done in short span of time, because irreparable damages may be happened, if the delay is more than the threshold.

A few assessment standards are to be considered in image encryption viz., "Histogram Analysis", "Adjacent Pixels Correlation Coefficient (APCC)", "Number of Pixels Change Rate (NPCR)" and "Unified Average Changing Intensity (UACI)". On the off chance that the upsides of these standards meet the ideal hope, this implies that the algorithm can resist the statistical and differential attacks [1]. Furthermore, an image encryption technique should have a major key space and high affectability to the underlying conditions to oppose the brute-force attacks [1].

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CROP MONITORING BY DRONE

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Abstract-More than two hundred thousand people enter the planet every day. By 2050, experts predict that the global population will rise to 9.6 billion. It's certain that this will lead to a rise in the need for food, which can be satisfied only by increasing harvest output. As a result, agricultural modernization has emerged as an urgent need. The use of drone technology in agriculture has the potential to address a number of issues that contribute to subpar harvest yields. A drone is a kind of Unmanned Aerial Vehicle (UAV) that may be piloted by a single person using radio control. Drones come in a wide range of sizes and shapes, each optimized for a specific task. The project is to construct a drone that can be stabilized in flight and used to take aerial photographs of a field, which can then be used to detect and assess crop damage. For this project, we combined the GPS tracking capabilities of the drones and the flight controller technology of the devices used to operate them to provide real- time audiovisual input. The operating distance to 2 kilometer (km) and installing cutting-edge features such a camera, screen, LED light, and powerful battery are in the works to boost performance. This finished implementation of the project makes it possible to monitor any region with little to no human intervention and to greatly minimize the amount of time and energy spent on agriculture. Everything from motors to receivers to transmitters to batteries to frames to cameras to screens to propellers is a part of its design.

Keywords: Drone, Crop Monitoring, UAV, GPS.

1. INTRODUCTION

There are significant problems that must be solved by the global agricultural system. During the next four decades, the UN Food and Agricultural Organization (FAO) estimates that food production would need to increase by 70 percent to keep up with growing demand brought on by improving living standards and expanding populations. Agriculture is a major industry in India and a major source of wealth. Almost 60% of the workforce in India is involved in agriculture. It's crucial to the success of the Indian economy. To raise agricultural output and efficiency, providing secure cultivation conditions for farmers is crucial. In a 2018 survey, researchers found that 9.2% of the global population had severe difficulties securing enough nutrition. Continuing to reduce food supplies will lead to a desperate situation. The food insecurity issue was moderate, affecting up to 17.2% of the population who did not have reliable access to enough food. Around 26.4% of the entire population is affected by the combination of a moderate and severe food availability issue. Food distribution systems and crop production were hit hard by the COVID-19 epidemic. Several farmers were hampered by the untimely delivery of essential agricultural inputs such as labor, seeds, fertilizers, and pesticides, leading to lower yields.

Many Asian countries are still in their developmental stages, and thus must deal with the problem of a large

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FAST IMAGE ENCRYCPTION BASED ON RANDOM IMAGE KEY

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Abstract-Over the last decade, researchers in the field of information security have focused extensively on the topic of picture encryption, leading to the introduction of several image encryption algorithms, and the Internet's central role in the dissemination of vast quantities of multimedia. The picture is one kind of this multimedia content. The sender searches for an encryption scheme to conceal picture data before sending it across the network in secrecy. The purpose of this work is to devise a color picture encryption method that generates a random image key and requires a minimal amount of time to encrypt and decode images. In this case, the XOR technique is utilized to spread the encrypted picture farther, resulting in a more secure transmission.

Keywords:

***Image Segmentation,Encryption,Decryption,*Wavelet,DWT**

1. INTRODUCTION

We said in the introduction that people are primarily visual beings, meaning that they use their eyes to interpret their environment. We use our eyes not just to locate and classify items, but also to scan for differences and get a "feel" for an environment with only a few seconds of looking around. Humans have developed highly refined visual capabilities, including the ability to instantly recognise faces, distinguish between different colours, and process a vast amount of visual information in a short amount of time. But the world is always changing, so if you stare at one object for too long, it will likely transform in some way. Even a large, substantial structure like a building or a mountain will take on a different appearance at different times of day, with different amounts of sunlight (clear vs cloudy), and with different numbers of shadows falling over it. Here, we focus on isolated pictures, or "snapshots," as they are sometimes known. Although image processing is adaptable enough to handle changing environments, we will not be focusing on this aspect. For our purposes, an image is any single photographic representation of anything. Whether it's a snapshot of an individual, a group of people or animals, or the natural world; a close-up of an electrical component; or the results of medical imaging, images come in many shapes and sizes. The picture will not be a random blur even if it is not recognised at first glance. An efficient way of encrypting digital images, random image keys are generated from the image's data and used as the encryption key. After the key has been generated in a secure cryptographic manner, it is used to encrypt the image. This method provides higher levels of security than conventional encoding methods by guaranteeing that the image cannot be decoded without the key. Discrete Discrete wavelet transforms (DWTs) include all wavelet transforms that make use of discrete sampling of wavelets and find use in both numerical analysis and functional analysis. Because it captures both frequency and spatial information, this wavelet

EARLY DETECTION OF DIABETIC RETINOPATHY USING DEEP LEARNING AND IMAGE PROCESSING

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Abstract-The human eye's vascular system plays a crucial role in ophthalmic diagnosis. Segmental fundus imaging is crucial due to the varying sizes of blood vessels and proportionately reduced contrast. To simplify the process of finding blood vessels in fundus pictures, we propose a deep learning (DL)-based approach. This imaging study has significant diagnostic value in the scientific community. The benefit of this technology is that it increases the precision of exudate segmentation and detection, which paves the way for the early diagnosis of several illnesses. In the field of biomedicine, it has a number of potential uses, including retinal image analysis, fundus, effusion detection, and CT machine image fusion. This strategy employs not just supervised and unsupervised techniques, but also morphological and clustering techniques. Since this is the case, edge detection has been enhanced. Performance measures like accuracy and sensitivity see significant boosts. Unfortunately, the current approaches cannot properly recognise edges or cluster the fundus effusion. Therefore, the proposed technique circumvents these challenges by integrating extremely efficient segmentation, extraction, and multi-structural morphological procedures to accurately identify retinal arteries and exudates. Basic techniques such as Daubechies wavelets, GLCM features, morphological processes, and K-means clustering are implemented. Classifiers based on neural networks often outperform other methods, including those that rely on statistical observation for pattern identification. Classifying new samples involves finding the distance between them and similar examples from training. The experimental findings show that the suggested technique can successfully identify vessels and exudates in retinal pictures with the desired sensitivity, accuracy, and selectivity.

Keywords:Ophthalmic,Effusiondetection,Morphological, Segmentation,GLCM,neural network

1. INTRODUCTION

The human eye is a light-sensitive organ that provides a window into the world around

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Fifth Generation Antennas: A Comprehensive Review of Design and Performance Enhancement Techniques

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ABSTRACT The intensive research in the fifth generation (5G) technology is a clear indication of technological revolution to meet the ever-increasing demand and needs for high speed communication as well as Internet of Thing (IoT) based applications. The timely upgradation in 5G technology standards is released by third generation partnership project (3GPP) which enables the researchers to refine the research objectives and contribute towards the development. The 5G technology will be supported by not only smartphones but also different IoT devices to provide different services like smart building, smart city, and many more which will require a 5G antenna with low latency, low path loss, and stable radiation pattern. This paper provides a comprehensive study of different antenna designs considering various 5G antenna design aspects like compactness, efficiency, isolation, etc. This review paper elaborates the state-of-the-art research on the different types of antennas with their performance enhancement techniques for 5G technology in recent years. Also, this paper precisely covers 5G specifications and categorization of antennas followed by a comparative analysis of different antenna designs. Till now, many 5G antenna designs have been proposed by the different researchers, but an exhaustive review of different types of 5G antenna with their performance enhancement method is not yet done. So, in this paper, we have attempted to explore the different types of 5G antenna designs, their performance enhancement techniques, comparison, and future breakthroughs in a holistic way.

INDEX TERMS SISO, MIMO, wideband, multiband, 5G communication, metamaterial, corrugations, dielectric lens, defected ground structure (DGS), antipodal Vivaldi antenna (AVA), multi-element antenna, monopole, dipole, magneto-electric(ME) dipole, loop, fractal, inverted F antenna (IFA), planar inverted F antenna (PIFA)

I. INTRODUCTION AND MOTIVATION

IN last few years, economic and social development is greatly influenced by the advancements in the field of mobile communication. As a result, 5G technology has emerged as a pedestal of the future 2020 generation. 5G technology is an emerging technology with evolutionary and revolutionary services. It is the next generation of technology to provide ultra high data rates, very low latency, more capacity, and good quality of service. It is worth mentioning that 5G technology will unleash new opportunities to leapfrog traditional barriers to development. As 5G technology supports IoT also, it gives leverage of a major societal transformation in the fields of education, industry, healthcare, and other social sectors. 5G technology is expected to unlock an extensive IoT ecosystem wherein many devices will be connected and by maintaining a trade-off between latency, cost, and speed a network can suffice the communication needs.

The 3GPP standards undergo continual change. The 3GPP investigates an organized release of new functionality and is responsible for new releases of standards as per the planned schedules. The 3GPP has stated three different usage scenarios of 5G communications which are as follows [1]:

- **Enhanced Mobile Broadband (eMBB):** It provides ultra high speed indoor and outdoor connection. It supports good and uniform quality of service at the edge of the cell, on highways, in aircraft, and train. Also, it

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SPEECH RECOGNITION USING DENOISING TECHINQUES

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Abstract-Computers often interact with humans through textual or graphical user interfaces as opposed to spoken human-computer dialogue. Automatic processes and any kind of password-protected computer software all use speech recognition. Research into voice recognition technology has increased greatly in recent years due to the proliferation of multimedia. Based on the decision-making processes used, its many applications for speaker identification fall under the headings of speech identification and voice verification. To demonstrate the potential for collaboration between people and machines in the advancement of technology, this project makes use of a vocal user interface. We are doing some signal deterioration using Gaussian noise and also editing some speech. Using Wavelet Transforms, we can get rid of the backdrop. Two or more signals were compared using correlation in MATLAB to determine which was the most reliable for use in creating the model. In this way, we may create a model where machines can recognise and respond appropriately to various types of instructions.

Keywords: Gaussian Noise, wavelets, symlet, coiflet, correlation.

1. INTRODUCTION

The use of language has a crucial role in the success or failure of a conversation. Speech communication and analysis have been greatly facilitated by the proliferation of digital data storage devices, as well as mobile and landline telephones. The term and the building blocks of speech recognition were developed in the early 1960s as a result of studies on voiceprint analysis, a concept similar to fingerprint analysis. In 1984, the science fiction novel "Star Trek to George Orwell's" introduced the concept of a computer able to detect the human voice.

People who have physical impairments, such as blindness or hearing, may now easily communicate with machines because to advancements in voice recognition technology. Therefore, the brain will use physiologic cues to decipher a tracheal voice. In this paper, we'll take a look at the five cornerstones of speech recognition and the research that's gone into them so far. Include voice enhancement, degradation, format analysis, pitch analysis, and speech editing.

Look at editing as a test for your skills. Search and destroy with your red pen or pencil like a kid playing a video game. Use the "find" function to look for problematic areas in your speech if you wrote it on a word processor. Just press a button and see them

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AUTONOMOUS FIRE PROTECTION ROBOT

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Abstract—**A fire is a catastrophe that can cause property damage,loss of life and undefined disability for the victim.Fire fighters are often exposed to advanced pitfalls. Humans are replaced by robots in danger of death case of figure as a result of the advancement of technology.Our objective is to create a robot able to detect and extinguish fires.Catastrophes can be prevented with minimal risk to human life by designing and applying a fire brigade capable of detecting and putting out flames. Thus, this project is improved in order to control fire with a robotic vehicle.This paper demonstrates simulation and perpetration of an independent fire protection robot which can describe the fire using different detectors,image acquisition and transmission of real-time updates to the remote user via the IOT for the purpose of extinguishing the fire.Additionally, the suggested robot avoids obstacles while moving forward in automatic mode to search for fire and pour water if fire detected. The robot can also be manually controlled by the remote user via a web page that can also displays live streaming from the ESP32 camera mounted on the robot.**

Keywords—*Arduino UNO, ESP 32, Flame Detector, Water Pump*

I. INTRODUCTION

Fire is both useful and dangerous. Fire is due to a chemical reaction. If oxygen in the atmosphere join forces with carbon and hydrogen in a fuel, a chemical reaction occurs. Therefore the energy as heat and light is liberated through this procedure. It's known as fire.For illustration, we use it for cooking our food, heating our houses in the winter and producing electricity. However, if the fire becomes uncontrollable, it can be very hazardous. Annually, lakhs of homes and businesses as a result of fire. Extensive forested regions are correspondingly devastated and more number of animals or are killed or wounded. We spend a huge amount of money annually to combat fires. And we're putting more time into trying to find new ways to to keep from it happening by taking action in advance and stopping fires.

The term robot is deduced from Karel Capek's show in early the 19's, comprehended as "robots" which means forced labor. A robot is a machine that is designed to perform tasks autonomously or with minimal human intervention. It is a type of artificial intelligence that has the ability to sense its environment, process data, and take action based on the data it has collected. Robots can be programmed to perform a variety of tasks, from simple repetitive actions to complex problem-solving activities. They are able to carry out repetitive tasks faster, cheaper and with more precision than humans.

Autonomous fire protection robots are designed to assist human firefighters in extinguishing fires, especially in situations where it may be too dangerous or difficult for humans to enter. These robots are typically equipped with a range of sensors and tools that enable them to detect fires, navigate through smoke-filled environments, and extinguish flames using water or other firefighting agents. The main objective of autonomous fire protection robots is to assist in fire fighting operations and provide a safer environment for fire fighters. These robots are designed to operate autonomously or semi-autonomously, without the need for human intervention in certain situations, such as in high-risk areas or where access is limited. Some specific objectives of autonomous fire protection robots include Early detection of fires, Safe and effective fire suppression, Navigation and obstacle avoidance, Remote operation. It uses an IR sensor, flame sensor and Arduino microcontroller board to control its movements and operations, along with a camera module that provides real-time video feed of the environment. By using these components together, the robot can detect fires at an early stage and provide a safe and effective method for extinguishing the fire.

II. A REVIEW OF LITERATURE WORK

The project is titled "Autonomous Fire Protection Robot". A robot is an automated device that resembles a human and does a variety of sophisticated activities. Let us take an examine in more detail about current fire protection devices. The attributes of the preceding robots that were comparable toward this robotic projects and were incorporated into the review of the literature are listed below:

The present thesis[1] is related to the robot that encompasses with a built-in real-time device. The source code is developed in such a way that it is unique among all other prototypes available in the market. When the user opts an automatic mode, the robo twill under go a set of field patterns untill the fire comes down. For directional purpose the robot uses the INFRARED Sensor. The output from the sensor is converted by A/D converters then the signal is then introduced into the microcontroller's input pin. The microcontroller would initiate actuators that will only be activated by the motors when only in the case of fire is observed. A liquid holding capable drum is placed on the on the head of the robot. Water is dispersed through flames to rule out fire. In their paper, they also showed us how the robot is monitored by voice.

"Pokey" - The robot designated for fire fighting. [2] is another documentary that denotes a kind of robot that protects from fire, who made his way out of contests, and became more "grave" than any existing system. The document comprises an elaborate explanation of the equipment utilized and fundamental operational algorithms. As the robot operates within a building or any type of residential complex environment, therefore it is outfitted with the requisite detectors. These robots offer valuable

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Multi spectral medical image fusion using NSCT

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Abstract-Multispectral image fusion seeks to consolidate disparate spectral and spatial data into a single image by combining relevant data and eliminating noise. In this paper, we provide a Non-subsampled Contourlet Transform (NSCT)-based multispectral image fusion model that makes use of PCA, Phase congruency, directional contrast, and entropy. The proposed method utilises principal component analysis (PCA) for dimensionality reduction, fusion rules, and colour alterations to the multispectral input image. Different fusion rules are used for the high-pass and low-pass bands: The fusion rule is implemented using phase congruency for low-frequency coefficients, and with a combination of directed contrast and normalised Shannon entropy for high-frequency coefficients. The proposed model provides a more thorough scene characterisation than any other image, and this technique is utilised to cut down on a great deal of superfluous information. The advantages of the fusion reaction may be seen when compared with other modern fusion processes.

Keywords: NSCT,PCA,CT/MRI,MRI/PET, SPECT/MRI

1. INTRODUCTION

Combining a high-resolution panchromatic image with a low-resolution multi-spectral one is the goal of the image Fusion method. The combination of panchromatic spatial data with multi-spectral picture colour data is what makes these pictures so useful for creating high-resolution multi-spectral photographs (Al-Azzawi and Abdullah, 2011 [1]). Medical diagnosis and evaluation need several types of medical imaging, including x-rays, CT scans, MRAs, MRIs, and PET scans (Adu, j. et al., (2016) [17]).

The information included in multi-modal medical pictures may be both complimentary and discordant. There is often less distortion in a CT scan of a dense structure such a bone, implant, or physiological alteration. Although the MR image may still reveal abnormalities and details about soft tissues, it is useless for gaining insight into bone. In this case, a single picture type may not be enough for conveying clinically relevant information to clinicians. Therefore, integrating medical pictures from different modalities is important and has recently emerged as a promising and difficult area of study (Aggarwal, 2013 [3]; Aktar, M. et al., 2018 [22]).

When two medical photos are fused together in accordance with predetermined guidelines, it seems as if they are a single image. Examining a medical fusion picture was all it took for the doctor to determine the exact location of the ailment. CT, DSA, X-ray, PET, SPECT, MRI, etc. are only few of the clinical diagnostic modalities shown in the medical picture.

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ENERGY EFFICIENT CLUSTERING THROUGH NODE OVERHAUL IN WIRELESS SENSOR NETWORKS

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Abstract-The primary purpose of node clustering in wireless sensor networks is load balancing and increased network longevity. The de facto standard, the low-energy adaptive clustering hierarchy protocol, manages to get there. Clusters of the same size may be created using an enhanced procedure called balance cluster creation, although this comes at the expense of some clusters being overlapped. In this letter, we discuss a node refresh technique that not only keeps clusters of similar size apart but also improves their energy efficiency. When possible, the suggested approach constructs initial clusters and then updates them with a second-best cluster head. When compared to previous simulated methodologies, the findings produced demonstrate a significant increase in network longevity and reduction in the mortality rate of individual nodes.

Keywords: WSN, efficiency, load balancing, network life time, USCs

1. INTRODUCTION

In the post-PC era, computing technologies like laptops, mobile phones, PDAs, GPS devices, RFID, and intelligent electronics have become more accessible to the general public, portable, widely dispersed, and pervasive. Nowadays, you can put together a portable embedded system with the computing capability of a PC from the 1990s using commercial off-the-shelf (COTS) components. Miniaturized OSes like Windows and Linux might be used to handle such embedded devices. From this vantage point, wireless sensor networks (WSNs) may be considered as the most recent example of the trend towards ubiquitously smaller computing power that Moore's Law has been pushing towards. A typical wireless sensor node consists of a number of different parts, including a sensor, processor, communicator, actuator, and power supply (or simply sensor node). The majority of these components may be placed on a single board due to their small size. Using state-of-the-art low-power circuit and networking technologies, a sensor node powered by two AA batteries may last up to three years in a low duty cycle operating mode of 1%.

Wireless sensor networks (WSNs) often consist of hundreds to thousands of such nodes exchanging information through wireless channels in order to gather, distribute, and analyse sensor data. Uses for wireless sensor networks range from global environmental monitoring and habitat study to battlefield surveillance and reconnaissance to search and rescue in emergency situations to condition-based maintenance in factories to infrastructure health

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DEEP LEARNING MODEL FOR OPTICAL DIAGNOSIS OF AN RETINA

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Abstract-Ophthalmologists often consider the health of the eye's vascular system when making diagnoses. In order to analyse disorders of the retinal vasculature, this project suggests analysing retinal images with an emphasis on the accurate identification of arteries and exudates. Retinal blood vessel comparisons play a crucial role in the early diagnosis of various illnesses. Retinal disorders such as diabetic macular edoema, drusen, and choroidal neovascularization may be detected with the use of a Deep learning model trained using the Convolution Neural Network (CNN) method. Retinal tissue may be imaged quickly and precisely using optical coherence tomography (OCT), a sort of image processing. To detect the retinal disorder, we employ the Keras deep learning framework. The most important result of this work is a method for diagnosing optical disorders from a photograph of the retina. Furthermore, the model may be represented in a web application by integrating it with the python flask framework.

Keywords: Deep Learnin,CNN,OCT,RNN.

1. INTRODUCTION

The days of limited access to health records are long behind. This is both a challenge and an opportunity for image analysis because of the exponential growth in data size (the transition to big data) brought on by

improvements in picture capture technology. In order to keep up with the ever-increasing volume of medical pictures and modalities, doctors need to put in long hours of labour that are subjective, prone to human error, and may show significant difference from one expert to the next. Alternative solutions exist, such as the use of machine learning techniques to automate the diagnostic process; nevertheless, standard machine learning approaches are insufficient when faced with complex problems. The ability to efficiently and accurately diagnose large medical imaging datasets is a goal that might be realised via the union of high performance computing with machine learning. In addition to facilitating the selection and extraction of characteristics and the creation of new ones, deep learning may also aid in the diagnosis of illness, the measurement of predictive targets, and the provision of actionable prediction models to aid physicians in their work.

Both ML and AI have made tremendous strides in recent years. Medical image processing, computer-aided diagnosis, interpretation, fusion, registration, segmentation, image-guided treatment, retrieval, and analysis, all rely heavily on ML and AI techniques. Information in photos may be extracted and represented more efficiently and effectively using ML techniques. With the help of ML and AI, medical professionals can make more precise diagnoses, estimate the likelihood of illness, and take preventative measures in a shorter amount of time. To better grasp how to examine the general deviations that will contribute to illness, these methods aid physicians and researchers. These methods combine traditional, non-learning algorithms like Support

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FIRE DETECTOR AND EXTINGUISHER MACHINE with IoT

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Abstract- Fire hazards are still a noticeable problem in the world where people and properties are being lost due to some small negligence. Fire detector and extinguisher machine helps the people in the fire hazards particularly in their residents. The fire detector is embedded with new type of technology which has camera and raspberry pi. The fire extinguisher act as a first aid and responsible for ignition of fire. The IoT take care of notifications to different people to react for the incident, which include informing to fire station with a message.

Keywords- ***Fire detection, fire extinguishing.***

1. INTRODUCTION

Fire is the rapid oxidation of the fuel(combustion materials) in the process of combustion which releases light, heat and various reaction products. Speaking broadly, fire is occurred due to unintentional negligence, irresponsible behaviour, or product or technology defects. Mostly fire hazards are found in the occupancy like smoking, storage, electrical appliances, trash, and heating. The fire incidents are classified into different categories, they are from ordinary fires(wood, paper, clothes, etc), liquids & gases, electrical fires, metallic fires, grease fires or cooking fires. A fire accident can be caused by any of the above class fire, the burns can be the result of many types of incidents. There isn't a standard legal process to deal with fire incidents, other than considering a workers compensation or negligence claim. In the part of fire extinguishing, there are very few techniques to identify the fire and intimate the owner or fire station. There are different types of technologies that are under the existence to detect the fire like heat detectors and smoke detectors which are useful today to identify the fire.

The human involvement is needed to intimate the fire station to come to the location. There are four stages of fire development, they are ignition, growth, fully developed and decay. The fully developed and decay fires need fire station intimation and they need water tank involvement to stop it. The last two stages of fire development can't be managed or stopped by basic extinguishers, but the first two stages like ignition and growth are manageable by basic extinguishers like fire extinguisher(containing monoammonium phosphate). But at present to stop all of these basic fires there is need of human intervention to detect it, alert to people and station, sprinkle water, etc.

The main goal of this project is to decrease the human intervention in fire detection and extinguishing by proposing a new automatic machine which does detection of fire through camera(more efficient), shooting the water on the fire, intimation to fire station through SMS with location, and providing user information(daily updates) through whatsapp and cloud.

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Incorporating Deep Convolutional Neural Networks for Melanoma Classification

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Abstract- Skin cancer occurs when abnormal skin cells multiply out of control. Malignant skin tumours grow when DNA damage in the skin goes unrepaired, causing mutations that result in genetic abnormalities that promote rapid cell division. The visual appearance of a skin cancer lesion is often employed as a diagnostic clue, making image processing a popular tool for this purpose. Ultimately, this work aims to help construct efficient and low-cost emergency assistance systems for medical image processing. which are computed in from photos of skin cancer in an effort to create diagnostic algorithms that may enhance emergency room triage procedures. In our study, we will use 'Convolutional Neural Networks(CNN) to categorise cases of skin cancer . This model outperforms the popular 'Support Vector Machine' (SVM) feature classifier in experiments. For the purpose of skin cancer categorization, this system has been shown to be more effective.

Keywords:DeepLearning, CNN, DNA, Melanoma .

1. INTRODUCTION

The most common form of skin cancer, melanoma, has seen a dramatic rise in cases over the last several decades. However, if caught early enough, it is also the most curable kind of skin cancer. The ABCD rule, which evaluates four factors (asymmetry, border irregularity, colour, and size), or the 7-points checklist, which uses a grading system for a variety of features based on colour, shape, and texture, are often used for making a clinical diagnosis of melanoma. Skin cancer, known as melanoma, is best treated if caught early. The patient's life may be preserved with an early diagnosis and successful treatment. In recent years, dermoscopy has emerged as a crucial tool for the detection of melanoma at an early stage[1]. This method involves making polarised light incident on oil-applied skin where a lesion is located. A digital camera is then linked to the dermatoscope to capture the picture. In doing so, the underlying morphological features of the skin are revealed. When a dermatoscope is used to take a picture, there are going to be some artefacts in the picture. The hair on skin may be separated out as a lesion because dark pixels will be labelled as a lesion, while the lighter pixels will be labelled as skin. Therefore, it is required to filter out the picture data that contains the hair. There are dermatoscopes that have a ruler on the side, making it easy to gauge the size of a lesion.

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SURVEILLANCE SYSTEM FOR MONITORING BIKE RIDERS WITHOUT HELMET AND TRIPLE RIDERS USING MATLAB

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Abstract-As the ratio of motorcycles to people in India continues to rise. Without a helmet, a motorcyclist's risk of dying is 2.5 times that of someone wearing one. While the provided video observation based system has the potential to be rather effective, it still relies heavily on human assistance, the efficiency of which decreases with time and is further impacted by the presence of bias. The authors of this research want to find a solution to this conundrum by developing an algorithm to identify cyclists who are and are not wearing helmets. Video of traffic in a public area is used as training data, with the system able to identify vehicles and pedestrians. This paper suggests a system that would operate by tracking the whereabouts of various riders who go on a journey without helmets. The suggested technique uses a support vector machine (SVM) model, which is a consistent form of SVM model, the leading methodology for object differentiating, to identify cyclists from the outset, and to then differentiate between those wearing and those not wearing helmets. If there are more than two

riders, the binary picture is vertically projected for a count. In many nations, the number of people injured or killed on motorcycles has increased dramatically over the years. More than 37 million people in India ride motorcycles. That's why it's crucial to have a system that can automatically identify whether a helmet is being worn or when a rider is taking three seats.Therefore, a Machine learning based approach is used to develop a unique object identification model that can identify motorcyclists. If the cyclists were found to be without helmets and to be travelling in groups of three or more, then the appropriate action must be taken. This study presents a method in which several riders go on a journey while without wearing protective headgear. The proposed method begins with recognising bikers using a consistent SVM model, the cutting-edge methodology for object distinguishing, which in turn aids in differentiating between helmeted and unhelmeted riders as well as between solo and group rides, before sending an SMS via GSM module to the appropriate authorities..

Keywords:SVM, Human Assistance, RFID, GSM, Arduino.

1. INTRODUCTION

It's possible that bikes may become a widely used mode of transportation worldwide. However, the lack of safety measures is a significant danger. Riders may considerably reduce the risks involved by using a

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OBSTACLE DETECTING AND LOCATION TRACING SMART STICK WITH GEO FENCING FOR VISUALLY IMPAIRED

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Abstract-When using the smart walking stick, the user is able to navigate with ease and do tasks with more comfort and ease. A normal stick does not detect obstacles, making it ineffective for the sight handicapped. Simply because a blind individual has no idea what kinds of stuff or things are shown to him or her. Our proposed blind stick features an attached Geo Fencing detector, a vibrator that will activate when an obstacle is detected with the help of ultrasonic sensor, and uses GPS to pinpoint the user's precise position. Using a mobile application, the GPS has been developed and programmed to provide some sense of the blind person's location. A software module called "Geo Fencing" utilizes satellite positioning system coordinates to create virtual fences. With our proposed blind stick, the user may feel the way around without having to rely on sight alone, and they can also identify any dangers in their path.

Keywords: GPS, Obstacles, Geo Fencing.

1. INTRODUCTION

A significant percentage of the world's population suffers from some kind of blindness. There are 285 million visually impaired persons in the globe, 39 million of whom are blind and 246 who have limited vision, according to the World Health Organization. The majority of the world's blind population, almost 90%, resides in the nations of development. Individuals with any remaining eyesight are not deemed blind. Having trouble seeing is a terrible affliction for the poor. They need assistance in walking outdoors and doing other everyday tasks; it is not uncommon to read about a blind person being injured while attempting to cross the street in the news. The family members worry excessively about their limited vision. As such, the suggested work illuminates a system that endeavours to liberate the blind from their condition and empower them to do their everyday tasks independently. It's a cane or stick that the visually impaired use to go about. But it is fully automated, easy to maintain, cheap and it is comfortable to use. Humans have always created tools and methods to facilitate and safeguard their everyday lives, whether for routine tasks like getting to and from work or more novel endeavours like taking to the skies. However, there are some impairments that hold people back from their progression and act as a barrier to their aspirations. Due, in part, to their inability to see, these folks have significant difficulty going about their everyday lives. They are restricted in their mobility, preventing them from going where they like or doing their duties without much difficulty. Trained canines are used to aid these people, but they

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ALERTING SYSTEM FOR ACCIDENTS CAUSED BY SLEEP DEPRIVATION AND EXHAUSTION USING PYTHON WITH WEBCAM AND MOBILE CAM

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Abstract- In recent years, one of the main contributors to car accidents around the globe has been driver weariness. Drowsiness in the driver can be used as a direct indicator of driver fatigue. To protect people and property, it is crucial to identify driver sleepiness. The project's objective is to develop a prototype sleepiness detection system. This real-time system continuously takes pictures, measures the condition of the mouth (MAR) and eye (EAR) by the predetermined methodology, and issues a warning when necessary. Although there are other ways to measure tiredness, this method is non-intrusive and has no negative effects on the driver, thus it provides an accurate picture of their state. The value of the mouth and eye closures is taken into account for the identification of tiredness. The driver is therefore classified as tired or drowsy when the eye closing and yawning last longer than a predetermined period. Dlib is one of the OpenCV libraries used to construct this system.

Keywords: MAR, EAR, DLIB, OpenCV

1. INTRODUCTION

Road accidents frequently result from fatigued or drowsy drivers. This system presents a module for an advanced driver assistance system to reduce the number of accidents caused by driver weariness and consequently enhance transportation safety. This technology focuses on automatically detecting driver drowsiness using visual data.The suggested OpenCV algorithms successfully locate and aid in normalizing human faces while being responsible for the majority of accidents associated with auto accidents. The program begins by spotting heads on color photos by analyzing variations in the structure and color of the background and human face [5]. Drivers are thought to show indicators of drowsiness and weariness by making a variety of facial and body motions, including yawning and having sleepy eyes. These traits show the driver to be in poor physical condition.

Drowsiness and driver fatigue are two of the most common factors in collisions. Every year, more people lose their lives in these accidents. With a username and password, the driver drowsiness detection System administrator can access the system. The user logs, frames, and EAR-MAR levels are both saved to the administrator system.

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DESIGN AN OPTIMIZED PLASMONIC HALF-ADDER USING WAVEGUIDE

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ABSTRACT

The limitation of standard electronics is reduced by all optical integrated circuits which have potential of high-speed computing and information processing. In this work, the basic structure for a half-adder is proposed by including nonlinear Kerr-material to the Mach-Zehnder Interferometers (MZI). It can be used for fast switching in the devices like integrated circuits. The proposed design used the 1.55μm wavelength. The size of the wafer is going to design 45μm x 11μm, which is very small compared to earlier designs. The half-adder design is evaluated in the OptiFDTD software, and the proposed design is analysed in the OptiFDTD.

Keywords: MZI, Keer material, Directional couplers.

1. INTRODUCTION

Surface plasmon polarisation (SPP) all-optical devices have been the subject of much study in recent years. To get over the primary performance limitations of semiconductor electrical devices, such as their intrinsic latency and significant heat

production, and to get around the difficulty of photonics devices, namely the diffraction limit, all-optical SPP devices stimulate intensive new research. In this way, the technologies discussed above allow for the manipulation of light at the subwavelength level. The primary goal, however, is to regulate the constructive/destructive interference of many light signals in several plasmonic wave-guides. All-optical switching devices are those that convert between constructive and destructive interferences, conceptualising this as a switch action. Future sub wavelength computers may have their fundamental components based on plasmonic logic gates performing AND, NAND, and NOR logical operations. Most recently, various all-optical plasmonic devices have delivered nanoscale logic gates. However, several all-optical designs had combinational logic capabilities. Some of these works investigate a surface plasmon polarisation (SPP) to achieve a desired function from the combinational logic functions. To the best of our knowledge, no combinational logic functions structure that meets the criteria of ultra-small feature size has been shown theoretically or experimentally to yet. In this dissertation, we propose, develop, and simulate logic functions and gates at the micro scale, including the directional coupler, Mach-Zehnder interferometer, half-adder. Results are obtained using opticFDTD. These gadgets will open the door to Nano-photonic integrated circuits in the near future. To link the various parts of the integrated nanophotonic system, waveguides play a crucial role. The effective coupling

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STRESS DETECTION USING MACHINE LEARNING TECHNIQUE

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Abstract—Stress is a most common source of physical and mental health issues that can effect our lives in various ways. Tenser Flow, Open CV and NumPy are powerful libraries that can be used to detect ,analyze and manage stress. Tenser Flow can be used to create and stress detection models , while Open CV and NumPy can be used to extract and analyze the facial expressions and body language to identify the signs of stress. These libraries can also be used to create personalized stress management plans based on a person's individua; needs, as well as to identify stress and suggest ways reduce their impact .With these tools ,it is possible to detect and analyze,

manage stress, providing people with the resources they need to improve their mental and physical health more accurately.

Index Terms—*Open CV, Tenser Flows, NumPy.*

I. INTRODUCTION

Stress is the most common problem in the today's world and everyone suffers from it at some point in their lives. Stress can last for a short or long period of time, but it has a mental impact and can lead to a variety of health problems. The surprising result that approximately 86% of Chinese employees are stressed at workplace it is the world record. Individuals over the age of 72 have the lowest level of stress. These reports show how the country will be in the future, with nearly 25% of people experiencing stress during the holidays. Generally, Stress is divided into four categories: acute stress, episodic acute stress, chronic acute stress, and posttraumatic stress. Acute stress generally occurs when there are serious burn accidents, severe motor accidents, or assault-related traumas. These Acute stress levels only last for a short time, up to 1-2 days. Episodic acute stress is a type of stress that is experienced in short bursts on an irregular basis. It usually involves a single event or situation, such as a traumatic experience, that causes intense stress. This type of stress can be particularly difficult to manage because it is often unpredictable and can be difficult to anticipate.

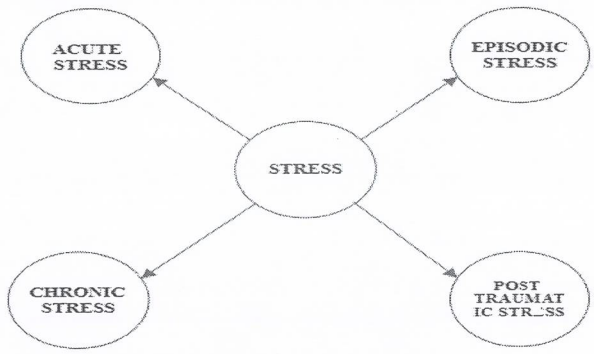

Fig-1.1

Chronic stress is a term used to describe the mental and emotional strain that builds up over long periods of time due to a variety of life circumstances. It is different from acute stress, which is a short-term reaction to a specific event. Post-traumatic stress disorder (PTSD) is a mental health condition that is triggered by experiencing or witnessing a traumatic event. It can cause intense fear, anxiety, and other emotional and physical reactions. Symptoms of PTSD can include flashbacks, nightmares, intense distress when reminded of the traumatic event, avoidance of situations that remind of the event, and feelings of isolation, guilt, and fear.

Based on the stress types classified above, we evaluate the user's stress using a machine learning technique because machine learning detects stress in real time for a large number of people with high accuracy. The main methods we are using in this project's development are eyebrow detection, blink detection, and real-time face emotion recognition. Eye blink detection generally counts the number of eye blinks from the user in a real time with high accuracy

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ROAD SURFACE CLASSIFICATION USING RESNET

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Abstract-An essential but unfinished challenge is the creation of a surface recognition system for automobiles. In this research, we take a fresh look at surface categorization by examining photographs of actual road surfaces. High surface classification accuracy is achieved by using the suggested experimental approach in conjunction with a deep neural network. This study contains original work for road surface categorization using Deep Learning architecture. The importance of studying the vehicle's status has grown as technologies like the advanced driver assistance system (ADAS) and autonomous driving have progressed. However, studies on how to categorize road surfaces have not been done as of yet. If the control system is capable of classifying and recognizing road surfaces, it can verify the data from other sensors and make a more confident decision. That's why it's so important to categorize the road surfaces.

Keywords:Deep learning architecture, Advanced driver assistance(ADAS), Autonomous driving technologies.

1. INTRODUCTION

The development of autonomous vehicle (AV) technology has been successful during the last several years. AV is being considered by major corporations as a means to lessen the number of traffic-related deaths and injuries. Researchers in Europe found that motorist mistake was the leading cause of traffic accidents. This causes over 25,000 fatalities annually in Europe due to traffic accidents. Financial losses are substantial even in the event of minor collisions. This highlights the significance of av as a means to counteract human mistake and improve road user safety. Although there has been significant progress in AV development in recent years, there are still several unresolved issues, including the creation of a surface identification (surface ID) system. This system should remotely categorize the road surfaces and warn the driver or av computer of potentially hazardous road surfaces, ice, standing water, or changes in the road path, allowing and the vehicle to remain safely under control as it transitions from one surface to another, thereby minimizing costly damage, avoiding injury, and potentially saving lives. One of the most important aspects of offering autonomous driving is the ability for vehicles to automatically adjust their speed based on the terrain.

Keeping tabs on the state of the roads is crucial for transportation departments worldwide. The quality of maintenance services given by contractors across various maintenance yards may be assessed, alternative treatment techniques compared, and the demand for maintenance services determined using the data collected on the state of the roads. Travelers and drivers may benefit from real-time data on road surface conditions by making more informed choices about when, where, and how to get from one place to another.

Road weather information systems (RWIS) placed at strategic sites or eye inspection and manual recording

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DEVELOPMENT OF A LOW-COMPLEXITY OUTPATIENT CARDIAC HEALTH ASSESMENT SYSTEM FOR IoMT NETWORKS

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Abstract-Heartdiseases and stroke have both contributed significantly to the rising death rates across all age categories in recent decades. As a result of lifestyle changes and dietary preferences, this has occurred. If you want to keep your heart in tip-top shape, it is crucial to have your heart checked often. Because of this, the mortality rate may be lowered when therapy is given quickly and efficiently.The health and efficiency of the circulatory system may be determined by a comprehensive examination of the heart Our goal in this article is to create a simple cardiac evaluation system using the IoMT in the medical field. Interoperability in Medical Terminology (IoMT) addresses medical terminology and provides trustworthy analysis that is both low-cost and easy to integrate with other systems. These IoMT services are available to patients. As a result, the patient's quality of life would rise. Since IoMT can save time and accomplish more, it has gained in popularity. The healthcare sector has seen a dramatic transformation due to IoMT. With this IoMT, we may anticipate not only an accurate result but also a quicker one. We have observed results for many online databases.Proposed algorithm shows the overall the accuracy is 98.4%, sensitivity is 99% and positive predictivity is 97.1%for detecting systolic peaks.Further Proposed algorithm shows the overall the accuracy is 98.8%, sensitivity is 100% and positive predictivity is 97.9% for detecting peak onsets. And real recorded data has 98.2% of accuracy.

Keywords: IoMT, HEART DISEASE, ECG, PPG

1. INTRODUCTION

Some health studies report that heart attacks are the cause of death for 14% of all persons each year. Detecting cardiovascular illnesses is challenging because of their subtle symptoms. To better understand how the cardiovascular system works, it is important to do a thorough inspection and evaluation of the heart. Smart gadgets and technological advancements have brought about notable change in the medical health care sector's approach to addressing health problems. Mobile Internet of Things devices may connect users to a variety of healthcare options. Future of Healthcare will be provided by the IoMT (Internet of Medical Things). The IoMT will revolutionise the medical industry in the future. Because of its potential for increased efficiency and time savings, IoMT has gained in popularity. This is a game-changing shift in the medical industry. High precision is to be expected with the time savings when utilising IoMT. Using sophisticated sensors, we can capture the heart's electrical impulses. This is an easy and fast way to evaluate the data in a brief time. Typically, IoT sensors are placed on people to record their vital signs and track other health metrics in real time. Predicting risk early allows for more effective treatment, and data collection, processing, and analysis are all key steps.

1.1 ECG:

The electrocardiogram is a test that captures the heart's electrical activity to diagnose several cardiac problems. Electrodes implanted on the chest induce a heartbeat, allowing for the recording of electrical impulses. The

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AUTOMATIC ENERGY METERS MONITORING IN BUILDINGS AND APARTMENTS USING IOT TECHNOLOGY

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Abstract-The term "internet of things" (IOT) refers to an emerging technology that uses the internet to manage and track electrical and mechanical equipment, vehicles, and other pieces of hardware that are also online. With IoT, users can monitor and manage non-digital objects through a familiar graphical user interface (GUI) accessible from anywhere with an internet connection. The goal of this project is to create a system for monitoring and billing energy use as well as controlling loads through the Internet of Things (IoT). Because going to the meter reading room and taking down readings is a necessary part of the verification process nowadays, keeping track of your power usage may be a time-consuming chore. Of course, knowing whether or not you were charged fairly is crucial, thus this necessity is undeniable. We simplify things by integrating internet-based meter reading monitoring for all consumers. Our suggested solution employs an energy meter coupled with a microcontroller system to track electrical consumption. The meter keeps tabs on how much energy is used and sends that data, along with the associated bill, through a Wi-Fi network. Blink, an IoT-based app, makes it simple for users to monitor their energy use and associated costs from anywhere, at any time. That's why it's so convenient that you can easily keep tabs on your power use and billing with

the help of the energy meter monitoring system. In this Project, a Single Channel AC Load12-0-12 Transformer is utilized as the Main source of Energy, and its operation may be regulated by an Internet of Things Application. Converting 12V AC to 12V Dc requires a bridge rectifier. By combining the functions of voltage regulators with filter capacitors, it is possible to generate a stable DC voltage. We've developed a straightforward method for remotely checking in on your home's energy use with a web-based IoT cloud application, no matter where you happen to be in the globe. It's simple to set up and operate while saving a tone of power.

Keywords: Energy Meter Monitoring, IoT, Node MCU, Wifi Module, Blynk

1. INTRODUCTION

The Internet of Things (IoT) is a relatively new breakthrough technology that entails adding sensing and communication capabilities to everyday objects in order to collect and analyze data. These Internet of Things-enabled gadgets may be used to keep tabs on a wide range of crucial environmental, electrical, and physical indicators. Thereafter, this data is analyzed, sorted, and used to the solution of a variety of real-world issues. Managing electrical power to minimize

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STUDY ON USAGE OF PRV METRICS FOR HEART HEALTH ASSESSMENT: A TIME-BASED SYSTEMATIC INVESTIGATION

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Abstract-The research work presented here discusses the pulse rate variability analysis using the photoplethysmogram signals (PPG) signals. Pulsatile signals, can be used to extract pulse rate variability (PRV), which describes changes in pulse rate over time. PRV analysis is made quicker and simpler to this research's contribution to PRV analysis.An automatic PRV detection algorithm developed is analyses the PPG signals to identify ectopic beats and correct any errors made during the detection procedure. In presented works mainly works on various time segmented PPG signals recorded under various ambulatory conditions. Presented works also will be evaluated by compiling a database of normal person pulses and a database of heart patient pulses and comparing them according to various signal variation lengths with the metrics values for better cardiac system assesment. Here we have taken reference signals from different data bases using PHYSIO BANK ATM. This is done in consideration of the pulse rate variability (PRV) metrics such as measures in the time domain (AVNN, SDNN, SDSD, RMSSD, pNN20, pNN50, PPAVG) and the frequency domain (VLF, LF, HF, LF/HF ratio, total power). When everything else fails, get out the correlation chart, the average accuracy is 99.39%, average sensitivity is 99.92%, average DER is 0.0067% and positive predictivity is 99.39% of the different data bases are calculated.

Keywords:ECG,PPG,PRV, AVNN, SDNN, SDSD, RMSSD, pNN20, pNN50, VLF, LF, HF, LF/HF.

1. INTRODUCTION

Heart and blood vessel issues are a part of cardiovascular illnesses (**CVDs**). The majority of sudden cardiac deaths are due to these illnesses. The best way to prevent cardiovascular illnesses is through early detection of aberrant cardiac events. Automated, trustworthy clinical feature extraction technology has recent. The most crucial function in increasing the computer-aided cardiovascular diagnostic system's diagnostic accuracy is played

by prediction approaches. The promise of continuous monitoring and earlycardiovascular eventprediction is furthered by current sensor innovation breakthroughs in wearable medical devices. Thus, methods for reliable detection of cardiac events in wearable devices should minimise power consumption[1-5]. Predicting abrupt cardiac events is also possible. As a consequence of the sympathetic and parasympathetic nervous systems, clinical metrics derived from ECG and PPG signals may give valuable insight into the operation of the cardiac system. Variation in the duration between systolic peaks in a photoplethysmography (PPG) signal constitutes pulse rate variability (PRV), a physiological phenomenon[5-7]. It's a way to quantify how much a signal's pulse interval varies from one iteration to the next. In particular, its variability provides very significant physiological information for cardiac diagnosis. Photoplethysmography (PPG) is an optical noninvasive method for measuring relative arterial blood volume changes from one heartbeat to the next. PPG signals are pulsating waveforms that show variations in blood volume and vascular abnormalities in the fingers. Time-frequency indices derived from the PPG signal are very sensitive to even subtle changes in

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LUNG CANCER DETECTION BY USING FUZZY CLUSTERING METHOD & MACHINE LEARNING TECHNIQUES

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Abstract-It is the lungs that are the origin of the disease known as lung cancer. Cancer is a condition in which abnormal cells (cancerous cells) develop uncontrollably and invade and destroy healthy tissues and organs. The best strategy to lower the death rate from lung cancer is by early identification. In this work, however, we use Fuzzy C-Means Clustering segmentation to precisely define each region's limits by computing its empirical image dispersion. Separating healthy tissue from diseased tissue requires a classification approach based on the Support Vector Machine (SVM), a machine learning classifier. Lung data obtained from the Kaggle site is used in the experimental assessment.

Keywords: Lung cancer, Fuzzy clustering segmentation, Support vector machine, Machine learning

1.INTRODUCTION

In most countries, lung cancer is the leading cause of cancer-related fatalities among both men and women. Lung cancer may be diagnosed at one of four more serious stages, numbered from I through IV. Stage I cancer with a diameter of less than 30 mm has a 67% five-year survival probability, stage IV cancer has a less than 1% survival rate. Hence, it is concluded that a high survival percentage may be achieved with early identification and treatment at stage 1. Yet, owing to the absence of symptoms in the early stages, lung cancer is often diagnosed too late to be treated successfully. Pulmonary nodules, which may be calcified or not, practically spherical in form, or with uneven boundaries, are a potential cause of lung cancer and have prompted research into lung screening systems. In thoracic CT, a nodule is defined as "a spherical opacity, at least reasonably well margined and no more than 3 cm in maximum diameter" by the Fleischer's Society. Almost half of all lung nodules are carcinogenic, whereas the other 60% are generally caused by infections. After the first nodule discovery, more tests are required to make a diagnosis since malignancy relies on numerous criteria such as patient age, nodule form, doubling time, and the presence of calcification. Segmentation, in the field of computer vision, is the process of dividing a digital picture into distinct areas or groups of pixels. All of the pixels in a given area have a similarity in at least one other attribute or calculated feature, such as hue, saturation,

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EMAIL SPAM DETECTION USING MACHINE LEARNING

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Abstract-Email is widely used for all sorts of communication nowadays, from personal to professional. Sensitive information, such as passwords, credit card numbers, and bank account details, are often sent through text message. This makes them desirable targets for cybercriminals looking to steal sensitive data. Emails that seem like they come from a legitimate business or organisation are a common tactic employed by fraudsters to trick their victims into giving over personal information. Phishing refers to the practise of sending an email that seems to come from a reputable company but is really trying to steal personal information. Results from experiments are given that set the stage for the classification challenge and investigate the use of machine learning techniques to identify fraudulent emails.

Keywords: Spam Detection, Phisihing, Email phishing,Machine Learning.

1. INTRODUCTION

Phishing is widely recognized as a complex and quickly expanding danger in today's environment. Social engineering and technological tactics are used in this illegal conduct to get sensitive information, such as user names and passwords, from unsuspecting customers (Manning & Aron 2015)[1]. Hence, according to Lungu and Tabusca, the present economic crisis is a result of the growing number of cyber attacks and data breaches that target internet users (Lungu &Tabusca, 2010)[2]. Malware, phishing emails, and malicious websites are all forms of phishing that have been identified based on their preferred method of spread (Jain &Richariya 2011)[3]. Generally speaking, phishing emails are just another kind of spam. Emails are sent to users pretending to be from well-known organisations, such as banks, and requesting that they click on a link inside the email. If you click on the link, you'll be sent to a malicious website designed to steal personal information, such as login credentials or financial details (Al-Momani and Gupta 2013)[4]. The phishing attack lifecycle is shown in Fig 1. The first step is to send an email to the recipients in an effort to convince them to click on the link within. Similar to how a fisherman uses bait and line to reel in a catch, a phisher will blast out as many emails as possible in an effort to "catch" as many potential victims as they can by getting them to click on a malicious link (Al-Momani and Gupta 2013)[5].

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ALERT SYSTEM FOR DISABLED PEOPLE

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Abstract-Generally, physically impaired people like paralysis, bone marrow damage and struggling with cope, will suffer so many problems in expressing their needs. We have developed a project to help the people for expressing their needs to the care taker. The needs of the patient like water, food, wash room and emergency instructions are predefined to the x and y axis of the gyroscope respectively. This project is implemented in such a way that by moving any of their flexible part of their body, according to their movement in particular axis the respective need will be intimated through buzzer and LCD display. This will alert the care taker and can respond according to the patients need. One of the main applications of our project is in ICU admitted patients, when the patients use this project the gyroscope sensor is attached to the hand of the patient so that when the patient does not receive oxygen properly or in any other emergency cases if the patient moves his hand away from the bed, then required axis is obtained so that the emergency indication like buzzer will beeps continuously. In this way our project saves many lives even in some cases like heart attacks. We have designed this project using gyroscope sensor, Arduino UNO, LCD display, Buzzer.

Keywords:LCD display, Gyroscope.

1. INTRODUCTION

According to the recent survey done by WHO it is found that nearly there are 1.3 billion disabled people are present that is approximately 16% of the total population. Disability is one of the parts of every human's life which is caused due to some health condition of the individual. Disability is defined as the condition of the people which restricts their moment and their sensing ability, simply losing control on their own body parts. This disability has become one of the major problems all over the world. For this reason, every time one person must take care of the patient to fulfill their basic needs. This disability creates a problem for disabled person as well as the care taker of that disabled person. There are different types of disabilities like intellectual disability, physical disability, mental illness etc. From this we are considering the problem of physical disability which are classified as paralysis, bone marrow damage, spinal cord injury, spina bifida.

Physically disabled people will face so many problems in some cases they can't even talk for expressing their basic needs like food, water and wash room. For these basic needs they must depend on another person so they must covey their needs to the caretaker for fulfilling their needs. Now a days we can see so many people died due to heart attacks because of no immediate reaction from the persons who is near to them, there any be a chance of saving their life's by giving immediate CPR to the patient. In this way the death due to heart attack can be avoidedfor saving the patient life.

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ADVANCED TARGET SYSTEM FOR SHOOTING

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Abstract:

Generally, the military plays a key role in protecting their countries mainly from terroirs attacks. During the training section of military officers one of the main parts is shooting targets from different positions. So, we are designing a project for increasing the accuracy of calculation of the target shooting ability of a person. This project is not only for military it is useful for any shooting trainings. Our project is to calculate the accuracy of shooting targets and even it also avoids the damage of targets unnecessary. In this project it has two types of targets available that is fixed target and movable target. When a person shoots a target, the percentage is calculated before the bullet hits the target and it will be displayed on LCD display this system is called as fixed target system. For this target we are using ultrasonic sensor and LCD display. When a person shoots a target, the percentage is calculated after hitting the target and it will be displayed on LCD display this system is called as movable target the name it self tells that it is a movable target in training time. The project will give all the details like if the person is selected, the person is disqualified or needs some more training depending on the shooting skills of that person. In this way our project will help in selecting the suitable person easily and accurately more over it also reduces the cost for preparation of targets.

1. INTRODUCTION:

There are different types of targets present which are used in different fields like in sports, military, and police training for the selection of the candidates. According to the need preferred targets are chosen. According to the serve done we have found that there are 4 different types of targets present they are paper, steel(reactive), clay and explosive targets. Paper targets are the basic targets used these are cost effective but not much useful, the one of the basic shapes is bull's eye. Another type is steel type targets which are also called as reactive targets because they produce sound based on the shooting skills. These are better than paper targets because this can be modified and can be reused and bring some new look by a simple painting process. The next type is clay targets these are made with the help of clay material they will gets burst when bullet hits the target there are so many drawbacks in this clay targets. The last is explosive targets in these two different explosive chemicals are mixed and used these are used as binary explosive targets. Due to cost and most danger chemicals this will not much used and in so many states the government has rejected this type of targets especially in the forest areas.

For solving all these problems, we have designed new type of targets with high accuracy and cost effective. By using these targets there will be no need of

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DETECTION OF FAKE CURRENCY USING IMAGE PROCESSING AND NEURAL NETWORKS

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Abstract- This study proposes a neural network classification technique for determining if currency notes are fake or original. In recent years, researchers have focused extensively on developing methods for the automatic detection and identification of Indian rupee notes owing to their many potential uses. It is shown that the Indian monetary system may be segmented using a set of distinctive non discriminatory characteristics. To begin, we collect the picture by use of a basic flat scanner set at a certain dpi and a predetermined size. From each musical note, its predominate hue and aspect ratio are extracted. Next, we cut off the section of the bill that had the serial number, security features, and other features that made it special. It is a method for determining the denomination of paper cash and matching it. The circulation of counterfeit currency is a major problem that has an effect on the economies of many countries, including India. Using the money's material attributes or its physical look are both viable options. This study proposes a new technique for valuing Indian currency that is contingent on the currency's physical manifestations. The security features of Indian currency, such as the security string, intaglio printing (the RBI logo), and the ID mark, have been widely used across the country, and picture preparation calculations have been obtained to extract these features. The final score of a large number of three highlights has been blended to distinguish between real and counterfeit monetary forms, making the framework more robust and accurate. The suggested framework has a perfect rate of correctly detecting counterfeit money. The mean square error, a measure of the quality of the presentation of the proposed framework, is often taken to be no more than 1%. It could also reach average people who have to deal with the problem of authenticating currency when presented with counterfeits.

Keywords: Intaglio Printing, DWT, GLC, RBI

1.INTRODUCTION

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FACE ANTI-SPOOFING BY COMBINING HIGH- AND LOW-FREQUENCY CHARACTERISTICS FOR SUPERIOR GENERALISATION POWER

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Abstract-In this work, In order to solve the face anti-spoofing problem, we propose a novel framework based on the Convolutional Neural Network (CNN) and the Recurrent Neural Network (RNN), which is motivated by the way humans decide whether a given face example is real or fake: by quickly scanning the entire face to get a sense of its overall appearance and then examining its local features in detail to pick out subtle differences (RNN). To be more precise, we apply deep reinforcement learning to characterise the action of exploring face-spoofing-related information in image sub-patches. We also create a recurrent approach to gradually train RNN representations of local information from the investigated sub-patches. In the end, we use a convolutional neural network (CNN) to learn both the local and global features of the input image, and then combine them to make a classification decision. We also conduct extensive experiments on a variety of open-source datasets, including an ablation study and a visualisation analysis, to further evaluate our suggested technique.

The results of our experiments reveal that our method is superior to the state-of-the-art since it achieves state-of-the-art performance in every scenario tested.

Keywords: FACE ANTI-SPOOFING CNN, rPPG, RNN, SVM.

1. INTRODUCTION

Improvements have been made in recent years on the FAS front. In the past, a Support Vector Machine (SVM) was taught to tell the difference between real and fake samples by using features collected from images using a number of methods that either worked in Spatial or Fourier space and relied on picture descriptors as representations. Nevertheless, the descriptors used to identify these features (such as Local Binary Pattern) were not created with the FAS problem in mind, hence they are not sufficiently discriminative. Recent studies have shown that deep learning-based solutions, which aim to construct discriminative representations in an end-to-end fashion, are superior to traditional countermeasures for spoofing assaults. Convolutional neural networks (CNNs) are initially introduced by Yang et al. addressing the FAS issue. They use features collected from the last layer of the Alex Net-based model to train a support vector machine (SVM) to categorise occurrences into one of two groups ('genuine' or'spoofing') [8]. To augment traditional binary labels, Liu et al. [9] search for additional supervisory signals. The use of supplementary approaches, such as the creation of pseudo depth maps and the transmission of supervision signals through remote Photo Plethysmo Graphy (rPPG) from the underlying RGB images, greatly aids in their training. Anti-spoofing

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BRAIN DISEASE DETECTION & BRAIN AGE ESTIMATION USING CNN

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Abstract-In this study, convolutional neural networks are used to make estimates of brain age and the categorization of brain diseases. To better pinpoint age-related imaging biomarkers using structural magnetic resonance imaging, researchers have been looking at brain morphometric pattern analysis (MRI). MRI is a noninvasive method that may be more sensitive than other biomedical imaging modalities for detecting aberrant structural brain alterations. Brain MRI scans were used to classify abnormality/normality including Mild Cognitive Impairment (MCI), Alzheimer's Disease (AD), and Healthy Control (HC). The effectiveness of the tried-and-true Random Forest Classifier is examined, implemented, and compared to that of the cutting-edge deep learning technology known as Convolutional Neural Network (CNN). Following these steps, an estimated brain age is calculated that takes into account the different abnormality/normality types.

Keywords: Convolutional neural network, Deep learning, Random Forest Classifier, Magnetic resonance imaging.

1. INTRODUCTION

Brain-like structure It's common knowledge that MRI machines are vital in the medical imaging field. T1w, T2w, and FLAIR are just a few of the MRI sequences that let researchers and clinicians zoom in on particular areas of the brain to learn more about their structure and illness. Stroke, Alzheimer's, and Parkinson's disease are just a few of the pathologies that may be diagnosed using an MRI of the brain.

With the MRI, researchers can examine how the brain processes new information while doing a variety of activities (functional MRI - fMRI). First and foremost, MRI is advantageous since it does not use radiation. As magnetic resonance imaging (MRI) takes longer to produce than other imaging methods like computed tomography (CT), it isn't always the first choice when time is of the essence. The structure of the brain and spinal cord may be studied with the greatest precision using magnetic resonance imaging (MRI). After being activated by hydrogen protons in the tissue, electromagnetic signals go back to the MRI machine. The MRI machine records their luminosity and then turns it into a black-and-white image.

Hyperintense and hypointense are terms used to characterise the MRI appearance of different brain areas relative to grey matter. We call hyperintense anything that outshines the brain's grey matter, and hypointense everything that's darker. One example is bone, which has the lowest proton density of any scanned component and hence looks darkest. Thus, we remark that the bone lacks intensity, or is hypointense. Always keep in mind that MRI may be utilised with contrast agents like gadolinium. Radiological contrasts improve the visual differentiation between the examined structure and the surrounding tissue. Typically, T1-weighted and T2-weighted sequences are used for brain evaluation, with FLAIR sequence coming in a close second. In contrast to T2w, which is often utilised to detect pathological abnormalities in neural tissue, T1w sequences are very useful for examining normal brain architecture. There is something special about these sequences that causes this. When it comes to elucidating structures dense with fat, the T1w

photonics

MDPI

Communication

An All Optical 2 × 1 Multiplexer Using a Metal-Insulator-Metal based Plasmonic Waveguide for Processing at a Rapid Pace

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Abstract: This study proposes, designs, and simulates a unique plasmonic Y-shaped MIM waveguide based 2 × 1 multiplexer (MUX) structure utilising opti-FDTD software. Two plasmonic Y-shaped waveguides are positioned facing one another inside a minimum wafer size of 6 μm × 3.5 μm in the 2 × 1 MUX configurations that is being described. The design parameters are adjusted until the plasmonic multiplexer performs as required under optimal conditions. Extinction ratio and insertion loss are two performance metrics that are calculated for performance analysis of the design, which indicate the potential to be applied in plasmonic integrated circuits.

Keywords: multiplexer; MIM waveguide; Y-shaped Waveguide; finite-difference time-domain (FDTD); plasmonic waveguide

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1. Introduction

The operating speed issue with its counterpart, the electrical circuits, has been widely addressed by all-optical systems [1,2]. As the bandwidth and bit rate of electronic-based processing and computing systems approach their limits, future optical communications and networks will require all-optical data processing. Researchers used a variety of techniques to create all-optical devices, including Kerr materials, Mach-Zehnder interferometers, the self-collimation approach, optical rings resonators, photonic crystals, and plasmonic waveguide [3–9]. This raised the need for photonics since it severely controls light and only requires a very minimal input power to switch on [10–16]. In addition to being faster and compact, these optical circuits are equivalent electrical circuits in size. The diffraction limit of photonic circuits has enabled a new field, plasmonics [17], which integrates photonics with electronics at the nanoscale and has attracted a lot of attention due to its reduced diffraction limit and higher frequencies, which allow for faster data transmission. The generation, detection, and manipulation of optical signals at the material interface are the main goals of plasmonics [18]. The primary drawbacks of plasmonic circuits include their limited propagation length, high heat emission, and difficulty in changing a signal's direction within the circuit [19]. In order to reduce these losses, plasmonic waveguides are used in these circuits to optimise both the length of surface plasmon propagation and confinement. Additionally, the fact that they can work in the visible to far-infrared range while using less power and a faster processing speed is drawing a lot of interest [20–22].

Numerous plasmonic waveguide types have been studied by researchers, including Metal-Insulator-Metal (MIM) [23–25], Insulator Metal Insulator (IMI) [26–29], and hybrid waveguides [30–32]. Plasmonic MIM waveguides, which have a dielectric core and

NON-INVASIVE GLUCOMETER USING NIR SPECTROSCOPY AND MACHINE LEARNING

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Abstract-In recent years, non-invasive glucometers have garnered considerable attention in the realm of medical diagnosis. The monitoring of blood glucose levels with a non-invasive method is more practical, less unpleasant, and faster. The high sensitivity of near-infrared (NIR) spectroscopy to glucose levels has made it a promising technique for non-invasive glucose testing. Infrared (NIR) spectroscopy and MATLAB's machine learning capabilities are used in this study to provide a unique method for a painless glucose monitor. The suggested approach begins with collecting NIR spectra of the skin of the subject, then moving on to feature extraction and selection to improve the dataset's discriminative ability. At long last, a machine learning system is educated and tested on the task of predicting glucose levels. The results show promise for the suggested technology in non-invasive glucose monitoring, giving patients with diabetes a non-invasive, accurate, and easily accessible option.

Keywords: Glucometer, NIR, MCU, PPG.

1. INTRODUCTION

Diabetes is an illness that may affect individuals of any age, making it a major health risk for the current generation. When the body's inherent processes for regulating blood sugar levels become impaired, the result is diabetes. High blood sugar levels associated with this illness have the potential to cause cardiac problems. Historically, diabetics' blood sugar levels were managed with a combination of diet and insulin injections. A person with diabetes has to constantly check or monitor their blood glucose levels. Glucose monitoring in the modern day often necessitates painful and intrusive techniques. We have to figure out how to get a reliable measurement of glucose without subjecting the patient to unpleasant monitoring procedures. Our noninvasive glucometer data will be stored in the cloud and reviewed on a regular basis to help guide future design choices.

This new type of non-invasive blood glucose monitoring system allows diabetics to monitor and manage their blood glucose level with greater ease, and it has promising market potential because it acts as a realtime system and overcomes the limitation of traditional invasive blood glucose metres, which require repeated fingertip blood. Diabetes is one of the leading causes of death worldwide, and it is not only a problem for the elderly and adults, but also for young

Band-Pass Filter Using Resonators

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Abstract: In this paper a Band-Pass filter is designed which is operating at Ultra High Frequency range between 1-2.5Ghz. The components that are used in the design of band-pass filter are 8 resonators and two coaxial feedings. PEC (Perfect Electric conductor) material is used to design the filter and the vacuum is used for designing the outer box. To solve the model, we have assigned Wave-port and taken the solution type as Driven-Terminal. We have taken the Terminal renormalizing impedance for both feeds as 50ohm and driven setup frequency as 1.5Ghz. Here we observed lower cut-off frequency(fL) as 1.2Ghz and higher cut-off frequency(fH) as 2Ghz with percentage bandwidth 50%. We have observed the VSWR, S-parameter, Z-parameter, Y-parameter followed by field report from the design of band-pass filter. These above results are obtained and verified by the simulation software HFSS (High frequency structure simulator).

KEYWORDS: Bandpass filters, resonators, HFSS, PEC, Wave-port, Driven-terminal, parameters-S,Y,Z.

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Automatic pill Reminder for Better Supervision

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Abstract: The functioning model of an Automatic Pill reminder system can help individuals who overlook taking their medications most of the time when necessary. Older people tend to forget their schedules. The project aims to help these people take their medicines on time. This system has a two-way alarm to make sure that people take their medicine i.e., the appropriate one at the right time. The machine reminds the user through sound that the buzzer gives to take the pill at a selected time, additionally showing the call of the medicine to be taken.

KEYWORDS: Atmega328 Microcontroller; Real-time clock; Buzzer; LCD; Keypad.

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Face Recognition Security Base AI Robot

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Abstract: In this paper, we are going to learn how to design a smart AI robot that can recognize a person's face, can recognize that person's voice and thus receive various commands for welcoming guests or for security purposes. One cab also preview live streaming with a camera through face recognition. Face recognition is an image processing method to locate the human face which need camera to capture the image of human face. The image processing will search the important feature of a human face on the image, thus another object will be ignored. The image processing locates human face used by various algorithm and method. This may vary according to the different shapes and sizes of the robot head design. Here, we are using the Open source INMOOV robot head that has been created using 3D printer. And make sure to securely screw the OLED displays onto the eye piece of the robot head. This paper also includes the gender, age detection through voice.

KEYWORDS:AI, Security Based Robots, IOT.

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Arduino Based Women Security System Using GPS and GSM Modem

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Abstract: Women security has emerged together of the essential requirements in our country. In today's world of advanced technology and smart electronics it's required to possess an easy and cost-effective safety gadget that helps the victims during unexpected dangers. But the planet Health Organization estimates that about 1 in 3 (35%) of girls worldwide have experienced either physical and/or sexual violence in their lifetime. during this paper "WOMEN SAFETY AND SECURITY SYSTEM USING GSM AND GPS" is defined to guard the ladies by oneself. This paper proposes a thought of alerting people to rescue her along side the SMS. When someone approaches to harass, she will just press the button and therefore the location information is shipped as an SMS aware of few predefined numbers in terms of latitude and longitude. then it plays a prerecorded voice which generates "HELP HELP" during a voice. the aim of this paper is to form the lady feel safe. This paper gives descriptive details about the planning and implementation of prototype for an electronic gadget which has the potential to function a security wear. With all the developing technology available to us , it is easy to create a security device for ladies which can not only send a message to your friends, family, or concerned person but also playing a voice file with "HELP". For this, here we are using an Arduino Mega which may be interfaced with GSM and GPS module for sending SMS alerts and getting the situation coordinates. And DF3 Mini player for enjoying pre recorded MP3 file.

KEYWORDS - Emergency Button, Arduino Mega, GPS Tracker Module and GSM Module, DF3 mini player, Etc.

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Driver's Drowsiness Detection and Alerting with Emergencyauto Parking System Based on IoT

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Abstract: Drowsiness is that the main reason for the road accidents that are happening. Drowsiness may be a process during which one level of consciousness is reduced thanks to lacking of sleep or exhaustion and it's going to cause the driving force fall under sleep quietly. Various studies have suggested that around 20% of all road accidents are due to fatigue-related only, up to 50% on certain usual roads. quite 25% of highway traffic accidents that are caused as a results of drivers drowsiness. to scale back the danger of an accident by warning the driving force of his/her drowsiness we've developed this project. during this project we detect the driving force drowsiness and alert the driving force with buzzer, albeit the driving force doesn't get alerted the system automatically parks the vehicle and it'll send the situation coordinates to the relations . This project is especially supported the subsequent process 1) Face and Eye detection: Performs scale invariant detection using Haar Cascade Classifier perform through a webcam. 2) Eye feature extraction: Eye features are extracted using Hough Circle and 3) Extract single eye 4) Euclidean Distance calculation with threshold and perform drowsiness detection thereon .

5)Vehicle speed control 6) Parking and sending location. within the proposed method, following the face detection step, the facial components those are more important and thought of because the best for drowsiness, are extracted and tracked in video sequence frames. The contribution work is when drowsiness detected, after it'll give alarm to the driving force using buzzer if the driving force doesn't respond it waits for the edge limit after crossing the edge limit the system automatically parks the vehicle by giving the signal indication and after parking it send the present location coordinates to the relations

KEYWORDS - Drowsiness, HaarCascade Classifier, Hough Circle, Image Processing, Real Time Drowsiness Detection, OpenCV, 68 Landmark co-ordinates, L293 Motor driver,

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Voice & Eye-ball Control Wheelchair

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Abstract: The automated wheelchair controlling is fully based on voice and eye-ball control. This system tracks the coordinates of the pupil in order to detect and make proper moves. As well as we have also included the voice control mode in which by saying some direction moving commands the wheelchair moves in that direction. We hve also included an emergency stop command that which fully stops all the process for safety purpose. This system integrates both the eye-ball or pupil detection and voice control based wheelchair control when compared to the existing system.

KEYWORDS: Gaze tracking, IFTTT, Rasberry pi, ESP32, Arduino, Raspbian OS, Ip webcam.

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Study of Abandoned Object Detection Implementation using Matlab

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Abstract: In this paper we come up with Abandoned object detection which is used for the surveillance cameras in the crowded places like airport, railway station and bus stations etc. Object detection is the most crucial step of video analytics. Abandoned object detection is one of the trending technologies and most useful area of computer vision. This algorithm takes video as an input from surveillance cameras and detect suspicious objects. If a new object is found without no apparent human presence for a certain period of time. Then it is declared as abandoned object and then an alarm is raised. In this way, we can recognize abandoned object using Background modelling and subtraction. This paper illustrates the implementation of object detection and tracking using MATLAB. We use the basic block diagram of Churned object detection and explains various predefined functions and object from various toolboxes. Some of the useful toolboxes include image acquisition, image processing and computer vision. Experimental results show that this system implements fast detection of abandoned objects.

KEYWORDS: Abandoned Object,Background Subtraction,Blob Analysis

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A Hierarchical Image Matting Model for Blood Vessel Segmentation in Fundus Images

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Abstract: In this paper, a hierarchical image matting model is proposed to extract blood vessels from fundus images. More specifically, a hierarchical strategy is integrated into the image matting model for blood vessel segmentation. Normally the matting models require a user specified trimap, which separates the input image into three regions: the foreground, background and unknown regions. However, creating a user specified trimap is laborious for vessel segmentation tasks. In this paper, we propose a method that first generates trimap automatically by utilizing region features of blood vessels, then applies a hierarchical image matting model to extract the vessel pixels from the unknown regions. The proposed method has low calculation time and outperforms many other state-of-art supervised and unsupervised methods. It achieves a vessel segmentation accuracy of 96.0%, 95.7% and 95.1% in an average time of 10.72s, 15.74s and 50.71s on images from three publicly available fundus image datasets DRIVE, STARE, and CHASE DB1, respectively.

Index Terms—Image matting, hierarchical strategy, fundus, trimap, region features, segmentation.



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IoT Based Social Distancing Monitoring Robot for Queue

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Abstract: Social Distancing has becomea very necessary situation these days as it limits the spread of covid – 19 pandemic. To ensure the social distancing in the queues we design this "IOT BASED SOCIAL DISTANCING AND MONITORING ROBOT FOR QUEUE". It is a robot consisting of wheels and using the line following principle to make sure it monitors the social distancing in the queues. To move 'to and fro' it uses IR sensors and for obstacle avoidance, it uses ultrasonic sensors in addition to that it also calculates the minimum distance between people. It sends the alerts in the case of defiance as well as it sends the pictures to the authorities through the Wi-Fi module over IoT.

KEYWORDS: Social Distancing, Raspberry pi 3 model b, Ultra-sonic sensor, IR sensors, Voltage regulators, Driver motor L293D.

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applied optics

Design of all-optical D flip-flop using photonic crystal waveguides for optical computing and networking

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The performance of an ultra-compact all-optical D flip-flop using photonic crystal waveguides is numerically analyzed and examined by optimized parameters such as refractive index and silicon rod radius. In the field of optical networking and computing, flip-flops are used to reduce the complexity of digital circuits. The phenomenon of optical interference effect is used to implement a D flip-flop at a wavelength of 1550 nm. This structure is designed using T-shaped waveguides without using non-linear material. The proposed design is small, has low insertion losses of 0.087 dB when operated at low power level, and provides high contrast ratio of 25 dB and transmission ratio of more than 96%. © 2020 Optical Society of America

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1. INTRODUCTION

Recently, optical devices have replaced conventional electronic devices due to properties such as higher switching operations, low power consumption, and large bandwidth [1]. Hence, all-optical devices are widely used in optical signal processing, photonic integrated devices, and optical networks [2]. Recently, many techniques have been used to realize all-optical devices such as optical fibers [3], Mach–Zehnder interferometers (MZIs) [4–7], semiconductor optical amplifiers (SOAs) [8–12], plasmonics [13], photonic crystal ring resonators (PhCRRs) [2,14–16], planar photonic crystal waveguides (PPCWGs) [17–19], metal photonic crystal (MPC) with parabola-like dispersion [20], and photonic crystal waveguides (PhCWs) [21–33].

Optical devices implemented with some of the aforementioned technologies have limitations: optical fiber-based designs suffer from chip-scale integration [3], and MZI-based devices have a problem of complex integration [4,5]. In SOA-based devices, operational speed decreases due to the carrier's recovery time and also suffers from spontaneous noise [8–11]. PhCRRs have drawbacks in that they have complex structures and require high input power [2,15]. In order to overcome these drawbacks, PhCWs are used. Many researchers are attracted to PhCWs due to their unique properties such as being compact in size, and having strong confinement of light and less power dissipation [22]. Therefore, PhCWs are widely used to implement all-optical devices.

All-optical flip-flops (AOFFs) work as a memory element for the optical devices, and hence these devices are used in optical routing, optical shift registers, and optical computing. Numerous methods are used to implement AOFFs. In [28], flip-flop is realized using polarization switch based on polarization rotation effect of SOA, but this method suffers from spontaneous noise. AOFFs are implemented using coupled laser diodes [29] and semiconductor distributed feedback laser (DFBL) [30], but these devices suffer with holding beam. In Ref. [31], flip-flops are realized using MZI but have a problem of complex integration. All-optical D flip-flops implemented with PhCWs provide strong confinement of light and require low input power, but these designs occupy more area [32,33].

In this work, to overcome the aforementioned problems in Refs. [28–33], an all-optical D flip-flop (AODFF) is proposed using T-shaped PhCWs with square lattice silicon rods in air background. This proposed design occupies less area, operates at low power levels, and provides high contrast ratio with less insertion loss. The propagation of light into waveguides is calculated numerically using the finite-difference-time-domain

Patient Health Monitoring System using IoT

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Abstract: Medical Infrastructure using technologies effectively increase the rate of success of treatment given to the patient. At present world is facing lot of tensions in regards to providing the medical facilities to the patients with the increase in number of diseases. So the use of technologies help doctors &health care system to do its job with much more ease in treating the patients. In this work we are facilitating with the solution for this problem of monitoring the health condition of sick person with the usage of wireless monitoring system. The crucial factors of patient health conditions of heart beat and any abnormalities are notified and the values of **BPM** are recorded on the web page for further reference.

KEYWORDS:patient Heart Beat, Internet of things (IOT), Data notification.

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ORIGINAL PAPER



Design of all-optical AND, OR, and XOR logic gates using photonic crystals for switching applications

Dalai Gowri Sankar Rao[1,2] · Sandip Swarnakar[2] · Venkatrao Palacharla[2] · Karyabhattu Seeta Rama Raju[2] · Santosh Kumar[1,3]

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Abstract
We propose a photonic crystal-based all-optical AND, OR, and XOR logic gates using square lattice silicon rods with air background. The design of proposed logic gates works on beam interference principle and operates efficiently by changing phase of light beams at 1550 nm wavelength. The proposed AOX logic gates are implemented with only one structure with variations in the phase of applied input signals. Simulation and verification of design are done by using finite-difference time-domain method. The design offers a contrast ratio of 33.05 dB, 10.50 dB, and 8.29 dB of proposed AND, OR, and XOR logic gates correspondingly with optimized refractive index and silicon rod radius values.

Keywords Photonic crystal waveguide · All-optical logic gates · Beam interference principle · FDTD method

1 Introduction

Usage of all-optical devices is increasing in optical signal processing, computing networks, and optical communication network. Photonic crystal waveguides (PhCWs) are used to realize the optical devices. These waveguides were formed by presenting the line or point defects into a structure that allows the transmission of light in the bandgap occupied by the frequencies. Recently, several methods are implemented to design all-optical devices such as optical fibers, but structures implemented with optical fibers have a complex structure and less operational speeds [1, 2]. In another work, nonlinear all-optical PhCWs were developed using a semiconductor optical amplifier (SOA) but the circuit performance is reduced due to the dependency of carrier's retrieval time [3, 4]. All-optical logic gates (OLGs) are realized using Kerr material, but those face a problem of complexity and nonlinear susceptibility [5–7]. Devices of all-OLGs that were designed using photonic crystal ring resonators (PhCRRs), but those have a complex structure and need high power to operate the device [7–11]. Similarly, polarization-independent all-OLGs are implemented in [12]. OLGs are realized with plasmonic waveguides which provide higher transmission rate; however, these designs suffer from less confinement of light [13, 14]. The OLGs implemented with multimode interference (MMI) have a problem of low bit rate [15–17], and Mach–Zehnder interferometer (MZI)-based OLGs are suffered from complex integration [18, 19]. Thus, to overcome the above problems, PhCWs are used to realize the all-OLGs. PhCWs have properties like small in size, low power consumption, high speed and strong confinement light [20–29]. All-OLGs are widely used in optical communications and optical networking such as optical AND logic gate used for the design of multiplexers and arithmetic logic units. Similarly, optical OR logic gate is used for designing comparators, and data encryption and optical XOR logic gate are used for the design of detector circuits and PSK modulators. These logic gates are implemented using nonlinear Kerr effect and ring resonators in a Y-shaped waveguide with two PhCRRs-based limiters [7]. But, that design has a complex structure and difficult in

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Underwater Image Enhancement Based on Color Correction and Fusion

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Abstract: For underwater images quality of those pictures are terribly low in comparison to traditional images. These images suffer from quality degradation, color cast, low brightness and degraded visibility because to absorption of light and scattering of light within the water. To beat these affects we proposed an effective underwater image enhancement to improve the standard of pictures in underwater and color correction is done. So, enhancement of underwater images is vital for images which are captured underwater. In our method we will take single image, which does not require any specialized hardware or knowledge about underwater conditions or scene structure. Our model consists of color correction, fusion of images. Firstly, color correction is done using white balance algorithm and after that gamma correction and sharpening of images are estimated for white balanced image. Then weights of fusion process are estimated and thereby normalizing the weights.Then, fusing of images is processed using Gaussian and Laplacian pyramids to construct the images that are more appropriate, perceivable and understandable for the human and machine perception. So as to guide the priority of underwater image enhancement, sufficient evaluations are conducted to discuss the impacts like color correction and fusion. Compared to different ways our proposed underwater image enhancement method can achieve higher accuracy and higher information retention.

KEYWORDS: Image enhancement, underwater, white-balancing, image fusion.

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Voice & Eye-ball Control Wheelchair

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Design of Optimized All-Optical NOR Gate using Metal-Insulator-Metal-Waveguide

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Abstract: In this work, an optimized NOR gate using a plasmonic-based Mach-Zehnder Interferometer (P-MZI) is suggested. A metal-insulator-metal waveguide structure is used in the design. It can be used for fast switching in the devices like integrated circuits. The proposed design uses the minimum no of P-MZIs, and also it uses the 1.5μm wavelength. The size of the device is 24 x 8 μm, which is very small compared to earlier designs. The NOR gate design is evaluated in the OptiFDTD software, and the proposed design is analyzed.

KEYWORDS: Kerr Material, Mach-Zehnder Interferometer, Finite difference time domain, Surface Plasmons.

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Intelligent Conference Hall Automation System

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Abstract: Electricity is the most valuable resource which is vital for Human life. Generally, Electricity is wasted due to our carelessness by switching on all the unnecessary electric devices like fan/light etc..,.Many of us forget to turn off the electrical devices like fan/ac/light when they leave the room .So Automation system is required to Control the devices automatically inside the hall. INTELLIGENCE CONFERENCE HALL AUTOMATION SYSTEM is the technology needed for saving electricity . It is a IOT based system which uses micro controller/ Arduino UNO to control all the electric devices inside the conference hall without any human effort and also this system is useful to counts(Bidirectional) number of persons inside the hall by using Ir sensors and indicates whether the hall is full or empty by using LCD and sanitize the persons outside the room by using ultra sonic sensor and the fan/light is on/off depends upon the person sits inside the hall and there is a buzzer indication for smoke by using MQ2 sensor and piezo electricity is used as alternate current source to save electricity. so, the system is completely automated by using IOT.

KEYWORDS: Automation system, Arduino UNO, IR sensor, LCD,MQ2 sensor, Piezo sensor.

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Color Image Steganography using LSB

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Abstract: As the technology growing the risk of sharing important information also became a hefty task without being attacked by any external malware, virus or hacker. As information is power so therefore care must be taken while transmitting the data over the internet. So certain security measures should be taken while transmitting the data. One of the methods that provides the security is Steganography. It is an art of hiding the data over a cover. It allows no one to suspect the existence other the sender and recipient. This is very efficient technique because of the simplicity and undetectable. Here using the Least Significant Bit technique for hiding the information. Which divide the image into different color components Red, Green, Blue. To embed the data into these components, so the data can be easily retrieved.

Keywords: Steganography, Color image, Least Significant Bit (LSB), Edge, Components

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Object Recognition Using Deep Learning

G.V.Vinod[1] | A.S.V.S.Anand Gopal[2] | K.Sneha Latha[3] | N.Harish[4] | B.Sai Kumar[5]

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Abstract: There are fascinating problems with computer vision,such as object recognition which is the combination of image classification and object detection. Our aim is to identify an object using deep learning.

In this project, we will be using a deep neural network named AlexNet to identify the object in any image. AlexNet is one of the most commonly used techniques for image classification. It can classify images into 1000 different categories, including keyboards, pencils, and other work related equipment, as well as various breeds of pigs,cats,parrots and other living creatures. The object recognition is especially well-suited to identification applications such as face recognition, self-driving cars, identifying illegal note in ATMs etc.

KEYWORDS:object recognition, machine learning, deep learning, existing system, proposed system.

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Early Forest Fire Detection

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Abstract: Forest fires represent a constant threat to human lives, ecological systems, and infrastructure. Many commercial fire detection systems exist, but the problem is they are very costly and difficult for maintenance and for considering forests like large areas it is very difficult to use. The approach for forest fire detection using image processing techniques is proposed. In this paper a forest fire detection algorithm is proposed, and it operates by converting the segmented moving regions from RGB to YCbCr color space and applying fire detection rules for finding out the fire pixels. The proposed method has both a higher detection rate and lower false rate. Since the algorithm is cheap in computation it can be used for real time forest fire detection..

Keywords— Forest fire detection, Image processing

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ARM Based Remote Controlled Farming Robot

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Abstract: *The main objective of this project is to control an agricultural robot through the Smartphone. In the current world, many countries don't have skilled labor regarding agriculture which may affect the growth of the developing countries. In India, there is approximately 70 percent of people are fully dependent on agriculture only. We need to know the basic agriculture methods to automate the process of sowing, ploughing, seeding, watering, by using an Arduino DUE ARM-based microcontroller, which is controlled through a Smartphone. The farming robot uses the esp8266 wi-fi chip module for connecting and controlling the app. These robots can agriculture the fields with a crop like a groundnut, onions, potato and many more. The world in the field of agriculture is changing from drones to an autonomous tractors to robotic arms and farming robots.*

KEYWORDS: Arduino, Arduino Due, esp8266 Wi-Fi Module, L293 Motor Control, H-Bridge, Blynk App.

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Attendence Monitoring System

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Abstract: In the perception of attendance monitoring system, It takes the attendance automatically using Facial Recognition. The construction is depends of the face recognition of students and applies the system to any classroom or laboratory while teaching. This concept mainly based on the algorithm called Speed Up Robust. The method consists of capturing the individual students or group of students Image in the class and compares with the pre stored individual identified images of the students with the individual or group image, if the student face is found in the group then the attendance will updated. The entire code is written in software called Python. Attendance database will Stored in MS-Excel file. Python is very high configuration software for simulation.

KEYWORDS:*Smart Attendance System, Numpy, NFC(Near-field communication), RFID(Radio Frequency Identification)*

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AI-Powered Attendance System

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Abstract: In this project , face of an individual is used for the purpose of marking the process of attendance automatic by using face detection and face recognition algorithms in the field of AI. Face detection and recognition algorithms are utilized to recognize students going to an address in a classroom and stamp their attendance by perceiving their faces. This process consists of an enrollment procedure in which the remarkable features of a people's face will be put away in labeled folders in a database. For marking the attendance,the student face is captured and is compared with the stored features in the database for respective students. When the face is identified by the system , the student is then marked present for the respective class and the details are stored as a CSV file .The analytics of students is displayed for each student in a day. At the end of each month or semester, the number of days that the student present or absent is calculated and stored for further proceedings.

KEYWORDS: Face Recognition, Attendance System, Webcam, Artificial Intelligence.

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Text To Speech Using MSER and OCR

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Abstract: This paper presents an in the optical character recognition (OCR) system. It introduces general architecture of modern OCR systems, discussing each module in detail. Specific contribution of this paper is novelty of the character extraction and segmentation, by considering them as image features. MSER (Maximally Stable Extremal Regions) feature detector is applied, discussing numerical and practical restrictions for character segmentation and recognition. The neural network is trained for character recognition. Detection and recognition of text from any natural scene image is challenging but essential extensively for extracting information from the image. In this paper, we propose an accurate and effective algorithm for detecting enhanced Maximally Stable Extremal Regions (MSERs) as main character candidates and these character candidates are filtered by stroke width variation for removing regions where the stroke width exhibits too much variation. For the detection of text regions, firstly some preprocessing is applied to the natural image and then after detecting MSERs, an intersection of canny edge and MSER region is produced to locate regions that are even more likely to belong to text. Finally, the selected text region is taken as an input of a novel Optical Character Recognition (OCR) technique to make the text editable and usable

KEYWORDS: Maximum Stable Extremal Region, Optical Character Recognition, .Net Assembler

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Object Detection using Ultrasonic Mapping with MATLAB

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Abstract: The aim of our project is to design a device capable to detect objects where non-contact distance measurement is required. In this project we will use ultrasonic sensor with configured arduino as a primary component for object identification and matlab software as a secondary for output mapping. Matlab is a high-performance language for technical computing like image processing and used as a graphical user interface. The reason behind the use of Ultrasonic sensors is to overcome the problems by IR proximity sensors and these sensors are well suited for object sensing applications like UAV navigation in drones, liquid level control in containers and anti-collision detection.

KEYWORDS:*Ultrasonic sensor, Matlab, Arduino, 3d-plotting.*

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Intangible Canvas Drawer Using Image Processing

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Abstract: Intangible Canvas Drawer is a modern technology that allows you to draw your imagination by just waving your finger in the air. In this, we have presented an Intangible Canvas Drawer using Image Processing which can draw anything on it by just capturing the motion of a colored marker with a camera. Here a colored object at the fingertip is used as the marker. We will be using the module called OpenCV to build this project. The language using here is python due to its exhaustive libraries. Color Detection and frame tracking are used to get the result. If the color marker is detected and a mask is produced. It performs the steps of morphological operations on the masked image generated called Erosion and Dilation. Erosion reduces the impurities present in the mask and dilation further restores the eroded main mask. This Project is more appropriate for seminars, webinars, and online classes.

KEYWORDS: OpenCV, NumPy, Python, Masking, Morphological operations (erosion and dilation).

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Comparison of Lung Nodule Segmentation Technique of Lung Adenocarcinoma Case using MATLAB

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Abstract: Lung cancer has become one of the most significant diseases in human history. By 2030, the worldwide death toll from lung cancer will be 10,000,000 estimated by the World health organization. The 5-year survival rate for advanced Non-Small Cell Lung Cancer (NSCLC) remains disappointingly low. In the current study, computed tomography (CT) scans were used for image feature extraction. The segmentation algorithm in this system played a very important role. A single click ensemble segmentation (SCES) approach is an extension for existing ''Click & Grow'' algorithm. The SCES approach, one seed point will be selected manually as compared with multiple operator inputs, which are typically needed. This results in processing large numbers of cases. By comparing the SCES algorithm with the two readers, the level set algorithm and the skeleton graph cut algorithm, we obtain an average SI of 78.29%, 77.72%, 63.77% and 63.76%, respectively. The proposed automatic lung lesion segmentation algorithm is stable, accurate and automated. So, we concluded by proposing a stable, accurate and automatic single click ensemble segmentation algorithm. The ''Click & Grow'' algorithms were applied multiple times resulting in increase of computational time for each case. Still we saved a lot of manpower.

KEYWORDS: Delineation, Lung tumor, Lesion, CT, Region growing, Ensemble segmentation.

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Conversion of Binary to Gray Code Using Opti FDTD Designer

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Abstract: Design of an all-optical binary to gray code converter using Opti FDTD. This device consists of a Mach-Zehnder interferometer as a switching element, switching the light from one port to another port at an ultra-fast rate. The performance parameters of these extension ratios and insertion ratios are obtained as 20.59 dB and 0.951 dB respectively.

KEYWORDS: All-optical, plasmonics Mach-Zehnder Interferometer, Gray code, error detection.

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Realization of All Optical Half Subtractor using 2-D Photonic Crystal Waveguides

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Department ofElectronics and Communication Engineering, Godavari Institute of Engineering and Technology (A), Rajahmundry, Andhra Pradesh, India .

Abstract: In this paper, we have reported an All-Optical Half Subtractor using 2-D photonic crystals of T shaped waveguides with square lattice and silicon dielectric rods in air background. The design is based on the principle of Beam interference mechanism. The performance of the proposed structure has been simulated and verified by using finite difference time domain method and the design having compact size, this design can be used in photonic integrated circuits and all optical signal processing. The model having a contrast ratio of 8dB and 13dB with optimized silicon rod radius that is 0.6a and has a refractive index of 3.36 and is operated at a wavelength of 1500nm.

KEY WORDS: Photonic Crystal, Half Subtractor, Defects, T-Shaped Waveguide, Beam Interference.

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Design and Implementation of All-Optical XOR and XNOR Logic Gates using Photonic Crystals by combining T and Y-shaped Waveguides

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Abstract: In this paper, all-optical XOR (exclusive OR) and XNOR (exclusive NOR) logic gates are implemented using two-dimensional photonic crystal waveguides. It uses a square lattice structure with silicon dielectric rods in an air background, as well as both Y and T-shaped waveguide structures. In this, the light beam operates at a 1550nm wavelength. The proposed design is based on the principle of the beam interference phenomenon. The contrast ratio of the XOR gate and XNOR gate is 8.27dB and 13.71dB. Both designs are operated at the refractive index of 3.42 by giving the best output values. By using the plane wave expansion and the Finite Difference Time Domain (FDTD), the designed logic gates are analysed and simulated.

KEYWORDS: Photonic Crystal Waveguides, All-Optical logic gates, Beam Interference Principle, FDTD Method, T and Y-shaped waveguides.

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DESIGN OF OPTIMIZED ALL-OPTICAL XOR GATE USING PLASMONIC WAVEGUIDES

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ABSTRACT

Most of the physical quantities are analog. We need to convert analog to digital, to transmit the data. This needs much hardware to operate. So, in optics data transmission is possible with high speed. Optical gates are extraordinary applications in ultra-high-speed Boolean operations and logical computation. The limitations in electronics are overcome by all-optical integrated circuits which have the potential for high-speed computing and information processing. An all-optical XOR gate using a metal-insulator-metal waveguide is proposed and designed. The analysis of the device was performed by using the finite-difference time-domain method and results have been verified in MATLAB simulation.

KEYWORDS: Kerr Material, Mach-Zehnder Interferometer, Finite difference time domain.

1. INTRODUCTION:

The scenario of present days is drastically changing the several developments in communication technologies is achieved by the development and implementation of all-optical components like logic gates and other combinational and sequential circuit elements[1-3]. All-optical components overcome the drawbacks of conventional semiconductor technology like power dissipation interconnection delays. To achieve excellent signal transmission and signal processing optical circuits are providing promising solutions. Photonics also lags due to the diffraction limit have become more vulnerable and the size of devices becomes very small or close to the operating wavelength. The solution to the above-mentioned problem is to overcome the drawbacks of electronics and photonics is overcome by the Plasmonics. The plasmonics is capable of alleviating the diffraction limit by exploiting the properties of surface plasmon polaritons(SPPs) which are bound at the interface between the metal and dielectric[4].

There are various SPP-based waveguides are demonstrated and proposed in recent times like metal-insulator-metal (MIM) and insulator-metal-insulator waveguides. Among these MIM waveguides are mostly preferred due to the ability of confinement of light to deep sub wavelength scale which leads to functionality at the nanoscale[5]. IMI has much longer propagation than MIM waveguides. In this paper, we are proposing the design of an all-optical XOR gate based on MZI with nonlinear Kerr material in one of the arms in the MZI[6-8]. The present work is based on the Mach-Zehnder Interferometer and it is proposed using the metal-insulator-metal (MIM) waveguide. The current work proposes an XOR gate structure. This XOR gate is designed only with is used only the two MZI's and MIM type of waveguides has been chosen due to its ability to route the optical signal at the nanoscale. Here in this design, we are primarily proposing MZI[9]. Thereafter we will propose an XOR gate.

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A Novel Construction and Block Error Rate Analysis of Polar Codes with Short Messgage Transmission over Different Channels

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ABSTRACT

Polar codes are usually constructed to minimize the upper bound of a block error ratio (BLER). In this paper, we discuss the estimation of the exact BLERs of polar codes as well as the construction of polar codes. Assuming that successive cancellation (SC) decoding is employed, we present a method for estimating the exact BLER of polar codes with the help of Gaussian approximation (GA). A new approach is proposed to construct polar codes over different channels (Awgn and Rayleigh+) with short message transmission scheme , aimed at minimizing the exact BLER, instead of the upper bound of the BLER. Analysis indicates that the new approach less complex than the existing methods. It is also shown that the proposed scheme is outperforms than conventional methods and are visualized in simulation results.

Keywords: *BLER, SC, GA, AWGN, Rayleigh*

INTRODUCTION

With the increased future smart transportation systems, rapid mobility takes place with variable Doppler shifts with time based phenomena in wireless communication. Peak data rate problems are encountered. So we need efficient encoding and decoding schemes to increase the peak data rate in high velocity environment.Hence,5G is the better candidate to attain data rates up to 20 Gb/s for eM-BB. So, efficient coding scheme is a challengingtask in wireless 5G for high mobility scenario,5G places attention on better-quality error-correction tedious [1].

5G stands for 5th generation. To be more precise it can be said as5therawireless systems or 5th era mobile-networks. It is the planned upcoming generation standard beyond the current LTE radio access technology standards. The peak speed that would be offered by 5G are5Gbps for downloads. Most of the RAN planning for the 5G network are currently ongoing and 5G basic aim is to provide better capacity than current LTE, VOLTE, which allows a sophisticated mobile density for high speed network users and reliable in D2D,ultrareliable, and massive-machine connectivity[1][2].

UNCORRECTED PROOF

Research article

Q2 Q3 Dalai Gowri Sankar Rao, Mohammed Simran Fathima, Paila Manjula and Sandip Swarnakar*

Design and optimization of all-optical demultiplexer using photonic crystals for optical computing applications

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Abstract: In this work, photonic crystal (PhC) based all-optical 1 × 2 demultiplexer is designed for optical computing and optical signal processing. The structure is implemented with two-dimensional PhCs using T-shaped waveguides with an optimized silicon rod radius of 0.2a. Performance of the proposed structure is verified and analyzed by using the finite-difference time-domain method. The design of all-optical demultiplexer is operated based on optical interference effect at a wavelength of 1550 nm. Proposed design occupies less area of 8.4 × 5.4 μm, provides a contrast ratio of 18.53 dB, 94.52% of minimum and 100% of maximum transmission ratio and it has less insertion loss of 0.017 dB; therefore, the proposed device is suitable for photonic integrated devices.

Keywords: beam interference; demultiplexer; FDTD; photonic crystals; t-shaped waveguides.

1 Introduction

Photonic crystal (PhC) is an adaptable platform to fabricate various optical integrated devices in the field of optical communication. At present, optical devices [1–2] are more popular due to less response time and lower power consumption as compared with the electronic devices. In order to overcome the limitations in electronic devices such as interconnect delays, high energy usage and power dissipation, the concepts of optical devices are introduced. Optical devices have advantages such as large bandwidth, high speed [3–4], low power consumption and unique density; hence optical devices are used in optical communication and optical signal processing. PhCs have an important property called photonic band gap (PBG); due to this, light does not propagate through the band gap within two spectral ranges. PBG is similar to forbidden energy band gap in electronics. In waveguides, light flow can be controlled by using periodic variation [5] of dielectric constant same as the electron control in semiconductor band gap.

Optical integrated circuits such as demultiplexer/multiplexer [6], adder [7–9], subtractor [10], comparator, encoder [11], decoder [12], etc. are designed using all-optical logic gates [13–15]. Distinct techniques have been introduced for the implementation of optical logic gates like semiconductor optical amplifier (SOA) [16–17], multimode interference [18–19], Mach-Zender interferometer [20–21], nonlinear Kerr-effect [22, 23], photonic crystal ring resonator (PCRR) [24–27], self-collimation [28–31] and plasmonic waveguides [32]. These works consist of some drawbacks such as large size, low speed and difficult to perform chip scale integration. SOA suffers from high noise, low gain and nonlinearity. Nonlinear optical materials consume high power and narrow operating frequency range. Plasmonic waveguides are difficult to implement because of their rigid, hollow pipe–shaped waveguides and more cost. PCRRs are limited by large size and relatively low speed. To overcome all the above stated difficulties, PhCs have been introduced for the designing of photonic integrated devices, optical processors, etc. All-optical demultiplexer is implemented using PhC waveguide, but the design occupies more area [33–34].

Photonic integrated devices have a grate attention on future size, but earlier designs have complex structures. In this paper, to overcome the limitation of huge size and high-power losses, we have designed an all-optical 1 × 2 demultiplexer using PhC waveguide. Moreover, proposed design investigated by finding out the parameters contrast

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Design of photonic crystal based compact all-optical 2 × 1 multiplexer for optical processing devices

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ABSTRACT

Through this work, an all-optical 2 × 1 multiplexer (MUX) is realized for optical networking and optical signal processing using two-dimensional photonic crystal waveguides. The structure consists of two T-shaped and one Y-shaped waveguide using square lattice silicon rods with a background of air. The all-optical MUX is designed without using any nonlinear material like Kerr material to overcome the problems of low gain and nonlinear susceptibility. This design works on the principle of beam-interference phenomena. The performance all-optical MUX is simulated with the help of the finite-difference-time-domain method and resultant outputs are verified using the distribution of the optical field at a wavelength of 1.55 μm. The proposed circuit occupies less area 7.8 μm × 9 μm and provides a transmission ratio of more than 92%, a contrast ratio of 29.66 dB in presence of select input and 23.2 dB in absence of select input and it can operate with a bit rate of 1.56 Tbps.

1. Introduction

In future, electronic devices would be replaced with all-optical devices due to their characteristics like high speed in operation, less power consumption, and noise handling capability, etc. Photonic crystal (PhC) device plays a vital role in the design of optical devices and which have periodic microstructures. All-optical multiplexer (MUX) devices are frequently used in communication systems, to transmit more signals through a common/single channel instead of using N number of channels for transmission. PhC devices control the motion of photons by defining allowed and forbidden bandgaps. The characteristics of PhC devices can be altered by creating the defects into the design and these defects are created by adding or removing dielectric rods in certain regions for the design of waveguides [1,2]. The demand for PhCs increases continuously in the field of a communication system; since it requires very low input power to switch on and confines light strongly. Researchers develop all-optical devices such as Kerr material [3–6], Mach-Zehnder interferometer [7–11], self-collimation method [12,13], plasmonic waveguide [14–18], optical ring resonator [19–21], photonic crystals [22–26], and photonic crystal waveguides (PhCWs) [27–32].

Earlier, PhC based MUX was designed using a nonlinear photonic crystal ring resonator, in which nonlinear rods were placed in a linear core section of PhCs. The systems lagged in speed due to the use of nonlinear materials and the structure had an array size of 25a × 56a with a lattice constant 'a' as 595 nm [33]. All-optical PhC based MUX/DEMUX (Demultiplexer) were designed using multimode interference by introducing the planar lightwave circuit into the design [34]. The design included a tapered waveguide to reduce the coupling losses between a conventional waveguide and PhCW, hence the former structure had an array size of 25a × 47a with a lattice constant 'a' as 570 nm [34]. The proposed design of all-optical MUX implemented using PhCWs based on the beam interference principle.

This paper consists of sections related to the design and operating principle of all-optical MUX demonstrated in Section 2, Simulation results discussed in Section 3 and Section 4 deals with the Performance analysis of the proposed structure with existing structures.

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ORIGINAL PAPER

Design of all-optical AND, OR, and XOR logic gates using photonic crystals for switching applications

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Abstract
We propose a photonic crystal-based all-optical AND, OR, and XOR logic gates using square lattice silicon rods with air background. The design of proposed logic gates works on beam interference principle and operates efficiently by changing phase of light beams at 1550 nm wavelength. The proposed AOX logic gates are implemented with only one structure with variations in the phase of applied input signals. Simulation and verification of design are done by using finite-difference time-domain method. The design offers a contrast ratio of 33.05 dB, 10.50 dB, and 8.29 dB of proposed AND, OR, and XOR logic gates correspondingly with optimized refractive index and silicon rod radius values.

Keywords Photonic crystal waveguide · All-optical logic gates · Beam interference principle · FDTD method

1 Introduction

Usage of all-optical devices is increasing in optical signal processing, computing networks, and optical communication network. Photonic crystal waveguides (PhCWs) are used to realize the optical devices. These waveguides were formed by presenting the line or point defects into a structure that allows the transmission of light in the bandgap occupied by the frequencies. Recently, several methods are implemented to design all-optical devices such as optical fibers, but structures implemented with optical fibers have a complex structure and less operational speeds [1, 2]. In another work, nonlinear all-optical PhCWs were developed using a semiconductor optical amplifier (SOA) but the circuit performance is reduced due to the dependency of carrier's retrieval time [3, 4]. All-optical logic gates (OLGs) are realized using Kerr material, but those face a problem of complexity and nonlinear susceptibility [5–7]. Devices of all-OLGs that were designed using photonic crystal ring resonators (PhCRRs), but those have a complex structure and need high power to operate the device [7–11]. Similarly, polarization-independent all-OLGs are implemented in [12]. OLGs are realized with plasmonic waveguides which provide higher transmission rate; however, these designs suffer from less confinement of light [13, 14]. The OLGs implemented with multimode interference (MMI) have a problem of low bit rate [15–17], and Mach–Zehnder interferometer (MZI)-based OLGs are suffered from complex integration [18, 19]. Thus, to overcome the above problems, PhCWs are used to realize the all-OLGs. PhCWs have properties like small in size, low power consumption, high speed and strong confinement light [20–29]. All-OLGs are widely used in optical communications and optical networking such as optical AND logic gate used for the design of multiplexers and arithmetic logic units. Similarly, optical OR logic gate is used for designing comparators, and data encryption and optical XOR logic gate are used for the design of detector circuits and PSK modulators. These logic gates are implemented using nonlinear Kerr effect and ring resonators in a Y-shaped waveguide with two PhCRRs-based limiters [7]. But, that design has a complex structure and difficult in

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DESIGN AND IMPLEMENTATION OF 2-BIT COMPARATOR USING QCA

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Abstract: Quantum-dot cellular automata (QCA) are one of the most promising emerging Nano electronic paradigms used for designing computers and very large-scale integration circuits. Comparator is a hardware electronic device and made up of standard AND, OR and NOT gates. This device takes n number of inputs in binary form and determines whether one input is greater than, less than or equal to other input. CMOS Comparators has a major drawback of size and power consumption leading to the failure of Moore's law . To overcome this disadvantage, Quantum-Dot Cellular Automata, an emerging Nanotechnology has been implemented. QCA provides faster speed with low power dissipation at nano-scale extent. In this paper mainly design of QCA- based 2–bit comparator with less latency in lesser area. Finally, in this paper developed the existing and proposed comparator layout and simulation by using QCAD software.

Index Terms – QCA Technique, Comparator, Quantum computing.

I. INTRODUCTION

A cellular automaton (CA) is a discrete dynamical system consisting of a uniform (finite or infinite) grid of cells. Each cell can be in only one of a finite number of states at a discrete time. As time moves forward, the state of each cell in the grid is determined by a transformation rule that factors in its previous state and the states of the immediately adjacent cells (the cell's "neighborhood"). The most well-known example of a cellular automaton is John Horton Conway's "Game of Life", which he described in 1970 in recent years, the complementary metal-oxide- semiconductor (CMOS) technology has been shown to have high power consumption and current leakage. Further- more, it has been associated with numerous problems in making CMOS circuits smaller; such examples are various physical phenomena, the specific mass of each element, and quantum effects that disrupt the normal function of transistors. With this background in mind, researchers have been attempting to develop small-scale technologies with low power consumption and current leakage. Quantum-dot cellular automata (QCA) are an emerging nano electronic technology, which have recently been reported to have a more efficient performance. Although designing QCA circuits is far more challenging than the CMOS technology, there has been growing interest in the simple structure of these circuits, as well as the variety of the methods used for their design and manufacturing. Design of the novel approximate XOR gates has been presented. It also describes the simulation parameters used to verify the design of the proposed 2-bit comparator and the evaluation of the results.

Any device designed to represent data and perform computation, regardless of the physics principles it exploits and materials used to build it, must have two fundamental properties: distinguish ability and conditional change of state, the latter implying the former. This means that such a device must have barriers that make it possible to distinguish between states, and that it must have the ability to control these barriers to perform conditional change of state. For example, in a digital electronic system, transistors play the role of such controllable energy barriers, making it extremely practical to perform computing with them.

The major objective of this work is to evaluate and explore the 2-bit comparator with the modified approach with a focused goal on 2-bit existing comparator performance in addition to less delay, spatial area reduction. The designing of existing and proposed 2-bit comparator and results is noted by utilizing the Q- CAD tool. Predominantly less delay in addition to the reduce the number of quantum cells is the main intention of this work. Furthermore, the design is made in such a way it must reliable as well as should have less in complexity. Since a less number of quantum cells are put into operation in the small area and the delay is reduced. The modified architecture of 2-bit comparator circuit is designed using Q-CAD tool and corresponding layout are obtained.

This paper contribute five sections, in first section give the brief introduction of QCA Technique see above section, Literature Survey and Existing Comparator explanation see in section two and three, section four and five give the Proposed comparator and results discussion and finally see the conclusion in section six.

II. LITERATURE SURVEY

In general, comparator finds application in most of the Digital Communication systems, processors, sorting of data and Analog to Digital conversion, Image processing, etc. Initially, a Serial-Bit Stream Analyzer (SBSA) using QCA was proposed by Janulis JR et al., (2004). The SBSA design, which was shown, requires a shift register and a multiple-bit comparator [1]. It is used to identify any random bit pattern appearing on its serial input. The SBSA compares the serial data with the available bit pattern, which was already at the other input of the comparator. The SBSA design generates output as '1' if two-bit patterns are equal; otherwise, it produces output as '0'. The SBSA is used in telecommunications for detection of header packets on transmitted data. This design simply uses XNOR operation as a comparator along with the 1-bit shift register as a bit slice. The authors suggested that the SBSA design could be extended to compare any number of inputs by replicating the bit slices. Whereas, the SBSA design occupies more area with higher clock zones. The configurations suggested [2-10] offer higher computational proficiencies, and circuits are capable of distinguishing all the three probable conditions. The three states are named as equality, lesser than, and greater than (here so-called full comparators) are demonstrated [2], [3], and [6]. The 1-bit comparator implementation has presented by Qiu K and Xia Y (2007). This 1-bit comparator was implemented by using XOR gate and NOT gate [2]. The authors, Xia Y and Qiu K (2008) refined the 1-bit comparator design by using the universal logic gate (ULG) [3]. This strategy does not detect the equality case thus it cannot be categorized as a full-comparator. Lampreht B et al., (2008) have designed a serial comparator. Whereas, this design performs the full comparator functionality with more delay [4]. Wagh MD et al., (2008) has exploited a tree-based architecture.

However, the proposal of n-bit comparator strategy can identify only A>B or A = B where A and B are n-bit inputs [5]. Xia Y and Qiu K (2009) have upgraded the 1-bit comparator design in [2] to design an n-bit parallel comparator [6]. The modular ULG.2 design

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A LOW POWER CONSUMPTION AND HIGH-SPEED CARRY LOOK AHEAD ADDER BY USING CARRY MASKABLE ADDER FOR APPROXIMATE COMPUTING

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Abstract: In this paper, we proposed a low-power yet high speed carry look ahead adder by using carry maskable adder that also maintains a small design area. The proposed adder is based on the conventional carry look-ahead adder, and its configurability of accuracy is realized by masking the carry propagation at runtime. Compared with the traditional carry look-ahead adder, the proposed 16-bit adder reduced more power consumption, since we are using less number of LUT'S the path delay is less according to the accuracy configuration settings, respectively. Furthermore, compared with other previously studied adders, the experimental results demonstrate that the proposed adder achieved the first purpose of optimizing both power and speed simultaneously without reducing the accuracy.

Keywords: Carry look-ahead adder, accuracy-configurable adder.

I. INTRODUCTION

Applications that have recently develop (such as image recognition and synthesis, digital signal processing, which is computationally demanding, and wearable devices, which have needed battery power) have created challenges contingent to power consumption. Addition is a key fundamental arithmetic function for these applications. Most of these applications have an inherent tolerance for insignificant inaccuracies. By exploiting the inherent tolerance feature, approximate computing can be adopted for a trade off between accuracy and power. At present, this trade off plays a significant role in such application domains. As computation quality requirements of an application may vary significantly at runtime, it is preferable to design quality configurable systems that are able to trade off computation quality and computational effort according to application requirements. The previous proposals for configurability suffer the value of the rise in power or in delay. In order to profit such application, a low-power and high-speed adder for configurable approximation is strongly required. In this paper, we propose a configurable approximate adder, which consumes lesser power than does with a comparable delay and area. In addition, the delay observed with the proposed adder is much smaller than that of with a comparable power consumption. Our primary contribution is that, to achieve accuracy configurability the proposed adder achieved the access of power and delay simultaneously and with no bias toward either. We implemented the proposed adder, the conventional carry look-ahead adder (CLA), and the ripple carry adder (RCA) in Verilog HDL using a 45-nm library. Then we evaluated the power consumption, critical path delay, and design area for each of these implementations. Compared with the traditional CLA, the proposed adder reduced power consumption and critical path delay better than conventional adder, respectively. We provided a crosswise comparison to demonstrate the superiority of the proposed adder. Moreover, we implemented two previously studied configurable adders to evaluate power consumption, critical path delay, design area, and accuracy. We also evaluated the quality of these accuracy configurable adders in a real image processing application.

II. OBJECTIVE

The objective of the paper is to avoid the high power consummation and reduce path delay with in the adder circuit design. Approximate adders are widely being advocated for developing of hardware accelerators to perform complex arithmetic operations

SDN in High Performance Computing for Scientific and Business Environment (SBE)

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Abstract—In recent scenario, need of computing is shifting towards High Performance Computing (HPC) not only for scientific applications but in commodity applications also. HPC cluster system allows HPC users to analyze and solve complex problems that are associated with large data size, such as big data simulation and big scale scientific simulation for quick analysis. It is highly required in the domain of science and industry for enhancing accuracy. Today, cluster system approach in demand for HPC systems rather than main frame system, cluster is a system of multi-core multiple computers interconnected in network. HPC apart from interconnect includes multiple standalone computers (PCs, Workstations, or SMPs) are based on processor technologies (like Intel, IBM P6, SUN SPARC etc.) , RAM, and motherboard architecture, further operating systems, middleware, parallel programming environments enhance it. In this paper, key factors like processor micro architecture(Ivy Bridge, Haswell), inter-core communication performance, inter-socket communication performance (Quick Path Interconnect) and inter-rack communication through 10 Gbps and Infinband's DDR and FDR performance and challenges are reviewed to improve and meet businesses need with incorporating Software Defined Networking (SDN) in HPC scenario.

Index terms—inter-core, inter-socket, QPI, inter-rack, infiniband DDR, FDR, SDN

I. Introduction

In present scenario, computing need is shifting towards High Performance Computing (HPC) not only for scientific applications but in commodity applications also, resulting immediate players as individuals/system integrators and Original Equipment Manufacturers (OEMs). HPC support researcher and developers to solve, analyze complex critical problems decision associated with large data, such as scientific simulation on large scale data size and types in the monarch of Scientific and Business Environment[30],[32]. Generally, these problems are used to solve by mainframe computers but currently due to large size of data having verity of sources that generate it, are big to compute and elongated to incessant results are seen on a commodity desktop computer or workstation so HPC has become an imperative technology and technique for large scale computations on big data. Today's HPC systems are integrated as a cluster system, which is a system of multiple interconnected machines in a switched network. Interconnect is the key of development and research for enhancing the performance of HPC cluster [31],[33]. The distributed and high-performance applications necessitate high computational power, high speed and bandwidth communication execution. In recent years, processor's micro-architectural development, the computational power of microprocessor increased in many fold in last few decades. Concomitantly, very low latency and very high bandwidth network interconnects are emerged. This is a optimistic trend for building high performance clustered computing environments by combining the computational power of commodity Personal Computing devices (Desktop, Laptop, Hand-held device) with the communication performance of high-speed network interconnect. HPC apart from interconnect includes multiple standalone computers (PCs, Workstations, or SMPs) are based on processor technologies (like Intel, IBM P6, SUN SPARC etc.) , RAM, and mother board architecture, further operating systems, middleware, parallel programming environments enhance it . In past few years, computation power of processors have been increased in many folds and nonetheless, need of low latency and high bandwidth interconnect has been realized and emerged to build high performance computing environment. Interconnection technologies play crucial role in improving price performance [17],[38]. Network adapters and switches connect nodes in a HPC cluster. At each node, a stack of communication protocol layer provides functional compatibility for inter-node communication mean while upper layers' protocols like MPI, PVFS, are made to take advantage of communication layer to endure user applications. One of the key challenges for a cluster designer is to selection of interconnects that best cope with the applications' communication requirements. Because applications can have very different communication characteristics, so meticulous knowledge of different interconnects and their performance are required, to know how they perform under these communication patterns [37] [38].

II. Ivy Bridge Micro-Architectural Features

Comparing with previous "tick phase" Sandy Bridge micro-architecture, Tock phase Ivy Bridge micro-architecture has few enhancements and it is the first to use Intel's Tri-Gate transistors. Xeon E7 v2 generation family supports up to 15 computing cores per chip without Integrated Voltage

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A Novel Cryptography System using Double Random Phase Encoding with Circular Harmonic Key

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ABSTRACT

We demonstrated a cryptosystem technique based on variation of rotation key using circular harmonic key with the help of double random phase masks in Fourier transform approach. It is observed that the encryption key generated in rectangular coordinates bear a tolerance of 0.2 degrees rotation of key in the decryption process. This leads to low efficiency security of whole system and less effective to brute force attacks and forgeries. A novel cryptosystem based on circular harmonics is introduced in Fourier domain, where the key is generated in polar coordinates, which gives the high tolerance with rotation of angle key. This resolves the security and efficiency of the cryptosystem. The numerical experiments are presented to demonstrate the efficient of the system and to show the proof of the concept.

KEYWORDS:Circular harmonic key, random phase masks, cryptosystem, Fourier transform, encryption and decryption,

1.INTRODUCTION

Through the mid1970's, cryptology was overwhelmed by state run administrations both on the grounds that PCs were extravagant and in light of the requirement for data retention.Several factors pushed encryption towards the standard. The most significant of these was the creation of the World Wide Web in 1989 and the inescapable utilization of PCs. Both modern business and individual correspondence must be secured.Cryptography is the investigation of secure interchanges strategies that permit just the cipher and expected beneficiary of a message to see its items. Data confidentiality, Integrity, Authentication, Non-repudiation are the center standards of advanced cryptography.we executed thiskind of encryption course of action involving the encryption-keys inrectangular Coordinates K(u,v), Thenwe saw that theunscrambling is a variation activity with the rotation of the key.Practically speaking, this difference is an issue that should be settled. We have proposed a solution for the issue utilizing a decay ofthe key in circular harmonics

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Study on Single-pixel Image Acquisition Using Compressive Sensing Framework

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ABSTRACT

A digital image is acquired on digital detectors like Charge Coupling Devices (CCD)/ Complementary Metal Oxide Semiconductor (CMOS) sensors. These digital camera sensors consist of thousands or millions of pixels in sensor array. The number of pixels constituting the digital image must satisfy the Nyquist-Shannon sampling theorem with respect to sensor arrays. Therefore, the cost of the digital cameras dramatically increases with the number of pixels in the sensor. Nevertheless, it is possible to make a camera that only needs one pixel. The principle of compressed sensing then allows an image to be generated. In the present work, the single-pixel imaging using compressive sensing (CS) framework is proposed with sampling the object information of interest using proper sampling operator before being detected by a photodetector. The numerical experiments are presented to verify the proposed single-pixel compressive framework. The results shows that single pixel camera is really efficient for good quality image reconstruction than the conventional imaging and provides good resolution at low cost.

Keywords:—Digitalimage,single-pixelimaging,Compressivesensing,Samplingmask

1.INTRODUCTION

Modern digital image cameras and video cameras requires thousands or millions of pixels to sense the object information of interest [1-6]. Development of computational methods including compressedsensing, compressive sensing, allow us to reconstruct full object image with a good quality from sub-Nyquist sampling measurements [7-9]. CS has been widely used in many image processing applications such as tomography [10-12], magnetic resonance [13-15], radar imaging [16-18], satellite imaging [19-21], SAR image [22-24], encryption [25-28]. The development of photodetector or bucket detector has given an idea for new sensing methodologies, that allowing the cost-effective imaging systems. A modest method of acquiring a digital image using a single-pixel detector is to sequentially obtain each pixel inraster-scan method. To sample the scene of interest, a light modulator is used to compress the scene before being detected by the photodetector. To compress the scene of interest various sampling mask or spatial patterns are used with various sample ratios through required computations. It implies that CS aims to carry compression during acquisition procedure itself. Moreover, the arrangement of CS based single-pixel imaging relies on reconstructing a high-resolution image from a lesser number of pixels or measurements with a cost-effective hardware and fastreconstruction computational software.

The concept and principle of photodetector and single-pixel imaging was first demonstrated braunik et.

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Arduino-based vehicle trailing and crash warning system through SMS

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ABSTRACT

Our lives have been made simpler by the rapid advancement of technology and infrastructure. The digital revolution has also increased mobility risks, and road accidents are becoming more common, leading to substantial loss of life and property due to a lack emergency services.Our project will give the best possible answer to this problem. In a car alarm application, an accelerometer can be utilized to detect risky driving. During and after an accident, it can be utilized as a crash or rollover detector for the car. A major accident can be detected using accelerometer readings.According to this research, if a vehicle is involved in an accident, a vibration sensor will detect the signal instantly, and if a car rolls over, a Micro electro mechanical system (MEMS) sensor will detect the signal and send it to the ARM controller.Through the GSM MODEM, the microcontroller sends an alarm message to the police control centre or a rescue squad, providing the location. As a result, once the information is received, the police may quickly trace the location using the GPS MODEM. Following that, relevant actions will be made when the location has been confirmed.This article may be used to precisely identify an accident using a vibration sensor and a Micro electro Mechanical system (MEMS) or an accelerometer. As there is room for development, we can include a wireless webcam for taking photos in the future, which will aid in giving driver assistance.

KEYWORDS:Arduino IDE,GSM,GPS,Vibrator sensor,accelerometer,buzzer

1.INTRODUCTION

The growing demand for vehicles has resulted in a rise in traffic congestion and road accidents. The people's lives are in grave danger. This is due to the lack of high-qualityemergency services in our nation. This study introduces an automated car accident alert system.This design is a system that can identify accidents in a fraction of the time and delivers basic information to a first-aid centre in a matter of seconds, including geographic coordinates, time, and angle of the car collision. This alarm message is transmitted to the rescue crew in a timely manner, allowing vital lives to be saved.The alarm message is automatically sent to the rescue team and the police station when an accident happens. The message is delivered over GSM, and the GPS module is used to locate the accident. Both the Micro electro mechanical system (MEMS) sensor and the vibration sensor may be used to accurately identify the accident. The MEMS sensor may also be used to determine the angle at which the automobile flips over. This application offers the most cost-effective answer to inadequate emergency services for traffic accidents.

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Design and Performance Analysis of 3.1 GHz Microstrip Patch Antenna

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ABSTRACT

Microstrip antennas are one of the most dynamic disciplines of antenna theory, with some innovative work being done in recent years. The growing demand for mobile communication and the advent of emerging technologies necessitate the efficient design of smaller antennas for applications requiring a larger frequency range. The Transmission Feed MPA resonates at 3.1 GHz with bandwidth ranges from 2.9GHz to3.1GHz. Result output shows that VSWR value is nearly '0' at resonant frequency which proves that the antenna is perfect impedance matched. The antenna is having outstanding radiation efficiency of 98.34 % and gain of -33dB.Above value proves that it is a high efficient antenna with maximum radiation in the desired direction only. The antenna is having narrow bandwidth of9.85 and decay factor of '0' which proves that its performance will not change with respect to time.

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Keywords:-Microstrip Patch Antenna, Dielectric, Patch, Solid1, Substrate, Transmission line, VSWR, CST software.

1.INTRODUCTION

Antenna is a transducer that converts electrical to electromagnetic signals. It is derived from the Latin word "Antenna," which means "call." Heinrich Hertz demonstrated that data or information may be sent wirelessly, and Guglielmo Marconi was the first to put it into practise, broadcasting the first radio signal in 1901. Scientist Robert E. Bob Munson (1940-2015) from the United States was the first to create the Microstrip Antenna in 1972. He designed a number of MPAs for various US programmes and persuaded a number of customers to switch from protruding antennas to conformal microstrip antennas. It is a printed antenna that operates at microwave frequencies larger than 1GHz and is well-known for its ease of production on PCB and MCM, small size, low weight, and ease of use.When a patch antenna is activated at a resonant frequency, it creates a strong field inside the cavity and a large current on the bottom surface of the patch, which produces considerable radiation. It has only one reference plane and is made up of four parts: the ground plane, the substrate, the patch, and the feeder. Changes in the form and size of the patch, as well as the permittivity of the material, can be used to calculate the antenna's resonant frequency. The most important Benefits of Microstrip Patch Antennas

- It's simple to integrate into any active or passive circuit.
- Solid state components can be added directly to the microstrip antenna board, making such circuits compatible with modular designs.
- Feed line and matching networks are produced simultaneously with the antenna construction.

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Design of Horn Antenna for Surface Ship Radar Application using Computer Simulation Technology

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ABSTRACT

This technical paper describes about design of horn antenna. The simulation and its analysis is done using Computer Simulation Technology. They are widely used for applications such as radio astronomy, satellite, terrestrial communication, plasma diagnostics etc.... It has no resonant elements, they can operate over a wider range of frequencies and bandwidth.The material used in the designing is Perfect Electric Conductor . The designed horn antenna is practical for Surface Ship Radar Application and the gain is 15.5 dB and the operating frequency is 2 GHz . The parameters of these antennas like Directivity, Gain, S-Parameters, VSWR, Efficiency are calculated by using CST software.

Keywords : Horn Antenna, PEC, CST, Bandwidth, Frequency, Gain, resonant element

1.INTRODUCTION

A horn antenna is additionally called microwave horn. A Horn antenna could be a sort of aperture antenna which is specially designed for microwave frequencies. the primary horn antenna was designed with pioneering experiments through microwaves by a radio researcher namely Jagadish Chandra Bose in 1897. The present horn antenna was invented separately in 1938 by G. C. Southworth& Wilmer Barrow. additionally, an oversized range of radiation characteristics will be obtained in line with the kind of horn and therefore the excitation conditions like polarization and propogation. A Horn consists of a flared length of waveguide ending during a radiation aperture. The several horn configurations bust most popular used are Sectoral horn, Pyramidal horn, Conical horn. By doing flaring impedance of 50 ohms with the free space impedance of 377 ohms for better graphical record. It eradigates VSWR ratio for providing great directivity and narrower beam width. The Electromagnetic Horn Radiator is understood as flare wave guide. Φ is thought as flare angle of the horn antenna which is a crucial parameter to be considered. The flaring not only helps in impedance matching but also gives higher directivity and narrow beam width thus we get the specified graph. The antenna is meant for various purposes like long distance communication, microwave applications, medical applications. the most reason for horn antenna to be most popularly because it is employed as feeds for other antenna like parabolic, lens antenna. The horn antenna is widely classified into Pyramidal horn, Sectoral horn - E-plane and H-plane, Conical horn, Corrugated Horn Antenna and

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Smart Helmet for Real-Time Accident Detection

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ABSTRACT

When a traveler is involved in a high-speed accident while not wearing a helmet, it's dangerous and may lead to death. This project is designed to boost driver safety. The projected system has detectors enforced within the helmet that may discover whether or not it's worn by a person or not. An Associate in Nursing discovers a drunk driver victimizing an MQ3 sensor. This method conjointly sends emergency alerts to Associate in Nursing locations to the person expected within the event of an accident. Arduino could be a microcontroller to control the complete system element. This is often enforced by the victimization of GSM and GPS technology. The vibration sensors area unit is placed in several places on the helmet wherever the prospect of impact is higher and connected to the microcontroller board. Thus, throughout the Associate in Nursing accident, these sensors discover signals and send them to the microcontroller. board, the controller extracts GPS information victimization the GPS module connected thereto. If the information exceeds the minimum load limit, the GSM module can mechanically send messages to emergency contacts

KEYWORDS:Arduino, IR Sensor, MQ3 Sensor, Global System for Mobile communication, Global Positioning System.

1.INTRODUCTION

It is a very well-known fact that two-wheeler or motorbikes are the most convenient way or method of transportation which gives us the flexibility to move anywhere at any time, and not be dependent on a four-wheeler or public transportation which can sometimes be unreliable in many cities. however, riding a motorbike or a two-wheeler has its own risks and complications when the rider does not follow the set of rules and regulations and needed precautions for them to avoid risk involved situations. As a two-wheeler is more vulnerable than the rest of the vehicles, even though there are rules and laws for the safe operation of motorcycles, they are not followed most of the time. Even though it is the responsibility of the traffic police to look after the implementation of those rules it becomes very difficult as the number of two-wheelers keeps on increasing rapidly. By the end of the financial year, 2019 India had around 296 million registered two-wheeler vehicles. in such scenarios, technological advancement can help us in the implementation of the rules and regulations needed for the safety of the traveler or rider

2. LITERATURE SURVEY

In similarity with other vehicles, two-wheelers are having less importance in increasing their safety levels. Compared with other vehicles the danger is very high for motorcycle riders. The smart helmet is even used in the mining industries for their risk and work. GPS and GSM are used for the identification of the precise location and

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Brain Tumour Detection Using Convolutional Neural Network

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ABSTRACT

In the early stages of life, identifying a brain tumour can be a challenging task. The problem of brain tumours is now a common occurrence. A lot of people are interested in automatic identification. Patients' data, such as MRI pictures of the brain, are used to detect brain tumours. Our task is to determine whether or not a tumour exists in the brain of the patient. For a patient's health to be preserved, it is critical to discover malignancies at an early stage. Deep learning will aid in the health business of medical diseases imaging in the Medical Diagnostic of all disorders, according to a recent field of this study. This machine learning method heavily relies on CNN. We presented a technique for extracting information.We suggested a convolutional neural network-based technique for extracting brain tumours from 2D magnetic resonance images (MRI). The experiment was conducted on a real-time dataset with a wide range of tumour sizes, locations, forms, and image intensities. The Convolutional Neural Network technique was used to determine the severity of brain tumours, which provided more accurate findings than the old pre-trained models.

KEYWORDS: Deep learning, Convolutional Neural Network, Machine Learning, Magnetic Resonance Image..

1.INTRODUCTION

The brain is a large and complicated organ with 50–100 billion neurons. It is made up of a great number of cells, each of which has distinct purpose. The majority of cells that are produced in the body divide to develop new cells in order for the human body to function properly. Aged or damaged cells die as new natural cells grow. Then, in their place, new cells appear. When the body does not require new cells, they are produced. Furthermore, cells that are old or damaged do not die as they should. Extra cells are produced by the body, which form a mass of tissue known as a tumour. The delicate functioning of the body is harmed when a tumour is implanted in the brain region. Because of its location and tendency to spread, it is extremely difficult and dangerous to cure. The two most common types of brain tumours are benign and malignant. Non-cancerous tumours are called benign tumours, while cancerous tumours are called malignant tumours.

In biological sciences, such as tumour detection and classification, cancer detection and classification, and testing and inspecting vital sections of the human body, digital image processing (DIP) is a developing topic. In medical science, automatic brain tumour detection is extremely important. The brain (also known as the body's processor) plays a crucial role in the human body, which is made up of various types of cells. The brain is the most important part of our nervous system. The brain is a complex organ that controls thought, memory, emotion, touch, motor skills, vision, breathing, temperature,

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Increasing the Power Efficiency of Radix-4 Booth Multiplier with Pre-Encoded Mechanism

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ABSTRACT

The radix-4 Booth algorithm is widely used to improve the performance of multiplier as it can reduce the number of partial products by half. As we know, numerous additional encoders and decoders would cause the power consumption of the Booth multiplier to be considerable. In this paper, Booth pre-encoded mechanism is proposed to reduce the power consumption of the Booth multiplier. The proposed design can effectively reduce the power of the Booth multiplier dissipated in the redundant activities by disabling the Booth encoders and decoders from unnecessary working. Particularly, since the control signals are generate dearlyat the pipeline input register before the multiplier, the performance of our design is better than the traditional Booth multiplier. Based on the TSMC 40nm technology, the simulation results show that the proposed pre-encoded mechanism can reduce the dynamic and static power by 45%and65%, respectively, compared to the traditional 16-bit radix-4 Booth multiplier.As we compare to the previous designs,the proposed design has lower power consumption. Even compared to the approximate design, the proposed design has better power efficiency and can provide the exact products.

Keywords: Booth algorithm, low power multiplier, power efficiency, partial product, radix-4Booth multiplier

1.INTRODUCTION

Many digital signal processing (DSP) and machine learning applications are heavily dominated by multiplication e.g., more than 90% convolutional neural networks (CNN) computations are occupied by multiply-accumulate (MAC) operations .Multiplier is an important component in various hardware platforms. The conventional multiplication includes three major phases.Two inputs (multiplier and multiplicand) are multiplied to generate the partial products (PPs). Reducing the PPs' matrix into two rows by partial product reduction schemes The final carry propagated addition of the remaining two rows of PPs.The second phase plays a significant role in power consumption, cost, and overall performance. Then, the radix-4 Booth algorithm can improve its performance of multiplication as the radix-4 Booth multiplier can reduce the number of PP rows by half.

The authors provided a simple and intuitive encoding/decoding method to implement the radix-4 Booth algorithm; reference provided a modified sign extension structure to reduce the cost and to improve performance. In, the author found that the traditional radix4 Booth implementations may result in unnecessary glitches of PPs. Thus, the proposed the glitch-free Booth encoder and partial product generator to eliminate the unnecessary glitches of the radix-4 Booth multiplier.These traditional designs still suffer from high

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Haze Removal using Optical Transmission Map and Adaptive Atmospheric Light

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ABSTRACT

Haze removal is a very common problem that we face in photography and other fields; existing models are not very accurate in removing yellow dust and other disturbances caused by light scattering and reflection. We are attempting to reduce noise and haze in the image by using optical transmission mapping and adoptive atmospheric light. We are also attempting to increase image quality by using image enhancement techniques. Several studies are being conducted.

Using a variety of techniques, remove the haze and improve the image's quality and resolution. Existing methods are typically founded on various priors; as a result, they perform poorly in situations where the priors do not hold. By investigating hazy

Keywords: Transmission Mapping,Adoptive atmospheric light, Image processing techniques, Dehazing

1.INTRODUCTION

Haze is an atmospheric phenomenon caused by dust, smoke, and other dry particulates that obscure the purity of the sky. In the World Meteorological Organization's manual of codes, fog, ice fog, steam fog, mist, haze, smoke, volcanic ash, dust, sand, and snow are all classified as horizontal obscuration. Haze particles are produced by agriculture (plowing in dry weather), traffic, industry, and wildfires. When viewed from a distance (for example, from an approaching airplane), haze may appear brownish or bluish, depending on the angle of view concerning the Sun, whereas mist is bluish-grey. Mist formation is a humid air phenomenon, whereas haze is commonly thought of as a dry air phenomenon. Haze particles, on the other hand, could be useful. when warmer air over water collides with the cooler surface of the land.

Mist can also form when warm air from the land collides with cooler air over the ocean. Summer fog in San Francisco, California is caused by this. You can even make mist by exhaling warm air from your body into the cold air, as you're probably aware.

Mist is similar to its cousin, fog. The distinction between the two is determined by your ability to see. Mist has a lower density than fog. If you can't see more than one kilometer (two-thirds of a mile) ahead of you, fog is obscuring your vision. If you can see beyond that, it's mist.

The term haze is commonly used in meteorological literature to refer to wet aerosols that reduce visibility. Such aerosols are frequently formed as a result of

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Medical Image Enhancement Using Deep Learning

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ABSTRACT

Deep Learning image processing techniques are gaining traction in a variety of fields, including medical imaging. Image classification, segmentation, and denoising are among the most common tasks. The goal of this project is to improve Optical Coherence Tomography imaging of the optic nerve head (OCT). We use numerous state-of-the-art image Super-Resolution (SR) technologies instead of directly applying noise reduction techniques. SR up samples the low-resolution (LR) image to match the size of the high-resolution (HR) image. In terms of image enhancement, the up sampled LR image can be thought of as a low-quality, noisy image, whereas the HR image is the desired enhanced version. We tested a variety of image SR architectures, including super- resolution Convolutional Neural Networks.

Key words:—Deep learning . Convolutional neural network .Medical images . Segmentation . Classification . Detection.

1.INTRODUCTION

Deep Neural Networks (DNN) have seen a lot of success in image processing and analysis in recent years, beating humans in some tasks like image categorization. It was just a matter of time before DNNs made an appearance in the field of medical image processing. Because many existing MRI or CT images are of poor quality, improving medical imaging is a work with a high practical value. Traditional image enhancing approaches rely on histogram equali- sation techniques, which are ineffective with medical images. Recently, the DNN has been employed for image enhancement and MRI scan denoising in several studies.

We concentrate on improving or rather denoising pictures generated by Optical Coherence Tomography in this paper (OCT). OCT has become a popular method for examining optic nerve head tissues and monitoring a variety of eye diseases. However, speckle noise, as well as several other abnormalities, degrade the quality of OCT scans. There are several methods for denoising OCT images, both hardware and software-based. Multi-frame averaging, for example, is a hardware technique that dramatically enhances image quality but requires a considerable scanning time. Many patients experience discomfort and stress as a result of this. Filtering and other numerical algorithms are examples of software-based picture denoising techniques.

In the case of OCT image processing, deep learning has only been used for image segmentation and classification thus far.We are aware of only one previous work on OCT denoising.

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A Novel Irrigation System using IoT

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ABSTRACT

The Smart irrigation system has a necessity for making user-friendly environment for farmers. This paper presents an Automated Irrigation system based on IVRS (Interactive Voice Response System) for remote controlling and monitoring of irrigation loads. The system consists of temperature sensor, PIR sensor, Rain drop sensor and moisture sensor which is connected to the system (NodeMCU). This NodeMCU ESP8266 kit uses the sensors to receive the information about atmospheric temperature and moisture of soil and then delivers the data towards the user in voice format, so that user can take the decision according to the data whether to ON and OFF the water supply. The PIR sensor detects general movement of the things. The NodeMCU is an open-source software and hardware development environment that is built on a chip called ESP8266. The water pumps from motor is connected to more than one fields. The crop in the fields may or may not be same but the motor pumps water equally to all the fields connected to it. Because of this, some crops are not growing properly due to the excess amount of watering or less amount of watering. So, this project is mainly designed to solve these problems by pumping how much water the field requires. The motor is connected to the watering pipes of the fields with water regulators. When we switch ON the motor, the water flows to the fields through water pipes. When the field receives sufficient amount of water, the moisture sensor sends information to NodeMCU, which will send notification to the user. So that the farmer can stop watering to that particular field by giving voice command.

Keywords— *speech recognition; speech to text; text to speech conversion; NodeMCU ESP8266; temperature sensor; Soil moisture sensor, servo motor; PIR sensor, rain drop sensor.*

1.INTRODUCTION

Water is the necessity of every living creature. So, it is individual responsibility and prime duty to save water. In irrigation, most of the water goes in vain because of free flow irrigation. The water should be efficiently used in irrigation by the use of modern techniques. It is essential to know about the recent developments to overcome the free flow of water in irrigation and its management by using smart irrigation techniques. Smart irrigation has a necessity for making userfriendly environment to farmers [10]. In this work an embedded system is using wireless sensor was introduced to provide communication between the farmers control unit and farm unit [10]. Due to this technique the wastage of

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Wastage Seperation System

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ABSTRACT

The idea of keeping cities clean is becoming increasingly important as the number of smart cities grows. The amount of waste produced is excessive, and waste separation is a necessary precondition for effective waste recycling. Waste separation determines whether the full waste recycling and reduction process can be completed, and the physical labor necessary to handle it is extremely tiresome task. The problems due to the wastage are air pollution, soil pollution, water pollution, and causes landfills and when different wastes are mixed together, they will release harmful greenhouse gases So, we will create a microcontroller-based waste separation system that separates waste into different categories such as dry waste, wet waste, and e-waste(or) metal waste. By using our project, the whole process of wastage separation is automated.

KEYWORDS—*Microcontroller, Dry Waste, Wet Waste, Metal Waste, e-waste. Air pollution, Water Pollution, Soil Pollution.*

1.INTRODUCTION

According to the report published by "Atul Kumar Pandey, Rohit Sahu and Ram Veer Tyagi" Waste Management and segregation is a much-needed process in metro cities and urban areas due to spreading of diseases. It is estimated that India produces 42.0 million tons of municipal solid waste annually at present. Waste lying littered in the surrounding, dumped on open lands, becomes a major problem for various types of disease-causing bacteria and viruses hence, segregation, transport, handling and disposal of waste must be managed properly to minimize the risks of the public and environment.[1] When mixed dry and wet waste breaks down in lowland, it creates nasty greenhouse gases. Segregation makes it attainable to utilize and recycle the waste effectively.

Then the wastage separation comes into picture for carrying the process of 3R's effectively:

1. Reduce.
2. Reuse.
3. Recycle.

2. LITERATURE SURVEY

[1] Cherry Agarwal, Bhavesh Yevale, Chaithali Jagadish, "Automatic Waste Segregation and Management", International Journal of Engineering Research & Technology (IJERT), Vol. 9 Issue 06, June-2020.- This paper uses a conveyor belt mechanism along with capacitive sensor and proximity sensors are interfaced with the Arduino UNO microcontroller.

[2] M. K. Pushpa, Aayushi Gupta, Shariq Mohammed Shaik, Stuti Jha, Suchitra V," Microcontroller Based Automatic Waste Segregator", International Journal of Innovative Research in Electrical, Electronics,

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Low Power DNA Cryptography Based 64 Bit ASIC Implementation ff Convolution Encoder and Viterbi Decoder

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ABSTRACT

The transmitted signal is encoded with some non-essential information in the convolutional process, hence boosting the channel data capacity. For sensitive models, the Viterbi method is often used. Convolutional code decoding is commonly employed in communication systems such as satellite communication, relays, and local wireless channel networks. Furthermore, the Viterbi algorithm is employed in artificial speech generation as well as storage devices. Cryptography is a technique used to hide and secure information without any data loss. Using DNA cryptography, we have developed a convolutional encoder and a Viterbi decoder security system.DNA cipher is used to encode the encoded message at the convolutional encoder and decode the message at the Viterbi decoder. The Viterbi decoder is utilized in data communication system blocks. The word length is optimized, resulting in a significant reduction in chip area and decryption delay. The design and implementation of this algorithm have been done in Verilog HDL using Xilinx ISE design Suite14.7. The Xilinx tool for FPGA synthesis employs the Virtex-6 family.

KEYWORDS: Convolution encoder, Viterbi decoder, DNA Cryptography, Encryption, Decryption, FPGA.

1.INTRODUCTION

A Communication System transmits information from source to destination via a channel that can be wired or wireless. This paper mainly focuses on data transmission through wireless channels. Information transmission over wireless channels is hampered by attenuation, distortion, interference, and noise, which impairs the receiver's ability to receive accurate information. Convolutional coding is a widely used error-correcting coding method in digital communications. The transmitted signal is encoded with some non-essential information in the convolutional process, hence boosting the channel data capacity. The Viterbi algorithm is a well-known method for decoding convolutionally coded messages. This paper investigates the design of a convolutional encoder and Viterbi decoder using DNA cryptography. Convolutional coding is used in a variety of communication systems, including deep space communications and wireless communications. This project can be implemented using FPGA or ASIC.ASIC refers to Application Specific Integrated Circuit. Implementing this architecture using an ASIC is more efficient in terms of power and performance. On the other hand, ASIC is a fixed design that does not allow for much operational flexibility. The significance of the Viterbi algorithm's convolutional code decoding should

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IoT Based Early Flood Detection and Alerting System

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ABSTRACT

Flooding is the major turn-up disasters that occur in different parts of the world. As these causes a huge amount of loss in the human environment. To reduce and make the system from alert, detecting these conditions is very crucial. "IoT Early Flood Detection & Alert System" is an intelligent system which keeps close watch over various natural factors to predict a flood. To eliminate or lessen the impacts of the flood, the system uses various natural factors to detect flood. The system has wifi connectivity, thus its collected data can be accessed from anywhere quite easily using IoT. To detect a flood the system observes various natural factors, which includes humidity, temperature, and water level of Dam. For detecting changes in humidity and temperature the system has a DHT11 Digital Temperature Humidity Sensor. The water level is always under observation by a Ultrasonic Sensor. All the sensors are connected to Arduino UNO Microcontroller Board, which processes and saves data. The system has wi-fi feature, which is useful to access the system and its data over IoT. User is provided with a Android Application to Monitor the Flood Causing Parameters from anywhere in the World using Internet Connectivity. This paper also incorporates communication of the information collected effectively by using GSM.

Keywords – Arduino UNO, DHT11, Flood, GSM, Ultrasonic sensor.

1.INTRODUCTION

Flooding happens when water from a river, lake, or severe rainfall overflows, and it can occur at any time of year. Flooding may be extremely dangerous because when it occurs in an area where people live, the water carries objects such as houses, automobiles, furniture, and even people with it. It has the ability to destroy property, trees, and a variety of other heavy stuff. Flooded roadways have been a concern in various cities for years. There is a significant flow of traffic as a result of this. Both cars and passengers are becoming stranded in flooded areas, unable to find alternate ways to their objectives. People's money, time, and effort were squandered when traffic occurred. Despite the fact that the local government unit in charge of flood control has been increasing their efforts to notify commters about the situation in flooded areas during the rainy season, the dissemination of information to residents is still insufficient. Taking preparations and keeping everyone in the area informed about weather and flood conditions is preferable to coping with flood after effects. Floods are caused by a variety of factors and activities, and the consequences for people who are affected are severe. When individuals are alerted to the impending flood, they can be evacuated to safe locations and their belongings safeguarded. It is also possible to save the lives of animals. Considering the various challenges faced by the people and geographical places, an IoT based early flood detection and alerting system was created to assist road users in avoiding this hazard. By

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A Novel Transmission Line Fault Detection using GSM Technology

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ABSTRACT

Nowadays, technology has progressed to the point where its inclusion plays such an important part in human existence that the need for electric power for domestic, commercial, and industrial loads is increasing. In addition, managing the electrical power distribution system is becoming increasingly difficult. Therefore, examining such defects is a necessary and difficult task in the power system. The model that detects defects and their distance in the transmission line is required for reliable detection and study of these issues. This paper presents an Automated GSM-based fault detection that allows technical crews to respond faster to these failures, perhaps saving transformers and otherpower components from damage and disaster.

This system is designed using Arduino UNO Controlled Board, Node MCU, GSM Modem, LCD Module, and Fault sensing circuit as major components. The system automatically finds errors, analyses them, and categorizes them. Finally, the control room receives the fault information as the system automatically and reliably gives accurate fault location information, and the time necessary to locate a fault is greatly reduced.

KEYWORDS: Fault detection, Node MCU, GSM Modem, Arduino UNO, LCD Module.

1.INTRODUCTION

As we can see in our physical vicinity, a malfunction in the transmission network is very frequent, and it is extremely hazardous for us. In all sectors of the electrical network, such as generation, and transmission, the complexity of the electricity network is increasing. As a result, complex network failures occur, resulting in numerous economic losses and reducing reliability [1]. We should take precautions to fix this defect as soon as possible; if we fail to do so, it may result in a complete grid failure. Generally, 70% to 90 % of faults on overhead lines arise as a result of lightning strikes, storms, and flashovers, all of which are highly dangerous to society.

Types of Faults:

A fault is simply represented as a sequence of unfavorable but unpredictablecircumstances which might abruptly interrupt the power system's stable condition when the system's insulation fails at any point [2]. There are two types of defects in each transmission line network: unbalanced and balanced faults, often known as symmetric and asymmetric faults, respectively [3]. We observe that the majority of defects occurring in any power distribution system are imbalanced. Faults can be categorized as series or shunt faults.

Line-to-Ground Fault (LG):

These faults are the most prevalent type of shunt fault. When one conductor falls to the ground or comes

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Improved Algorithm for Locating Nodes with Minimum Error in Wireless Sensor Networks

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ABSTRACT

Recent advances in developing sensor nodes have made the use of Wireless Sensor Networks (WSN) possible in many different scenarios, most of them require each node to have some information about its geographical location. There are many other optimization techniques which are left with the drawbacks of mean localization error and consumption of higher computational time. This project presents a two-step distance-based algorithm to the sensor network localization carried out in a centralized architecture. The first phase of the algorithm utilizes an improved version of the DV Hop distance algorithm to provide coarse position estimates for all the nodes. During the second phase, Particle Swarm Optimization (PSO) is performed to further refine the output of the first phase. In the second phase, several techniques are also used to address the problems of localization such as flip ambiguity, collective translation and also overcomes the drawbacks of the other algorithms. This proposed method uses less computational time than the existing methods. MATLAB tool is used for analyzing the algorithm.

KEYWORDS: Wireless Sensor Networks (WSN), Optimization, Localization, DV Hop distance algorithm, Particle Swarm Optimization (PSO)

1.INTRODUCTION

The Wireless Sensor Networks generally consists of number of sensor nodes which can sense, compute and communicate with each other through a wireless link. The Wireless Sensor Network domain is applicable in many inspecting fields and offers wide range of applications like in environmental monitoring, disaster management, military applications and others. Simply gathering information from the sensors would not be useful without knowing the exact geographical location of the sensor node from which the data is sent. For example, a network is established to detect the forest fires in a forest [1]. Whenever the fire is detected, a sensor detects the abnormal increase in temperature and sends an alarm message to the base station to inform about the fire by passing through other nodes in a multi-hop manner. In this case, the message sent must include both the data and the location information of that particular node. The Localization techniques can provide an infrastructure to perform the algorithms like location-aware routing [2]. Therefore, self-localization capability has become one of the most important requirements in the self-organized networks.

The simplest way for localization is to go for Global Positioning System (GPS) adapter equipped with each node. But, the use of GPS technology is an expensive way not only in cost but also in size and power consumption. In practice, we consider only small number of anchor

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Cryptography for Secure Data Transmission in Public Health Care Systems

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ABSTRACT

The major challenge faced by health sector is data security, and to overcome this several advancements in medicine and biomedical research have proven to increase computer processing in data security. Cryptography is a secure and dispensable tool to secure the data or information in any organization. Cryptography provides secure communication in the presence of malicious third party. on and decryption schemes used to secure medical data is evaluated. These schemes are Blowfish, DES, AES, RC4, RSA, and CEC are well developed. The performance of these schemes was assessed through their execution time, throughput, average data rate and information entropy. For this performance assessment, some medical data were used for this task. The results showed that the performance of CBE, MTLM and CEC was better. CBE and MTLM offer a secure way to encrypt data with a significant reduction inthe execution time. Moreover, if some of these schemes werecombined to form a hybrid system, an enhancement in the security of medical data over wireless communication networksis guaranteed

.

Keywords—Data security, decryption, encryption, healthcare system, medical data, wireless media

1.INTRODUCTION

Cryptography enables you to store sensitive data without knowing by the unauthorized agents. So that it cannot ready by anyone except the intended recipient. The wireless communications market has enjoyed significant growth over the years. Moreover, with the recent advancement in the internet of things (IoT), the biomedical re- search community is moving towards transmitting a significantamount of clinical data (such as patient medical data) from a workstation to a remote center via wireless communication networks [1]. For example, Fig. 1 presents an example ofmedical data being measured, processed and transmitted toa distant medical center via a wireless medium

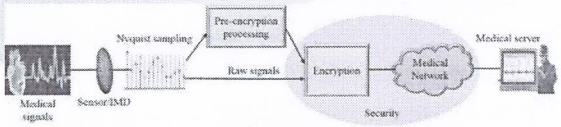

Fig. 1. Secure medical data transmission over a wireless media

As illustrated in Fig.1, the transmission of patient medical information such as the electrocardiograph (ECG) to a remote center by wireless means is becoming increasingly common in the biomedical research community. Some medical regulations require the sharing of medical data beyond a single inter-disciplinary medical center [1]. Therefore, utilizing sensors planted on the human body, this medical data

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Text-Independent Automatic Speaker Recognition using Machine Learning

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ABSTRACT

In the past decades, security is the main for everyone, and processing of security by the voice control. In this condition, security is designed by speaker voice command and speaker recognition for a short duration of text speech samples. In speaker recognition systems, the processing by Gaussian mixed models is impaired by low quality and short duration of the speech. We are proposing this project for forensic-based voice and speaker recognition and that way we are taking the voice and comparingit with the recorded voice. The voice matched and speaker recognition by preprocessing and recognized by machine learning. In this project, a large number of best material selection criteria were described, suitable for the scoring stage in forensic automatic speaker recognition systems. An application of quality-based speaker features performs outperforms forensic speaker recognition systems that assume the uniform quality of speech during model training and scoring. The speech(or)speaker recognition was described by the combination of discrete wavelet transform (DWT) and Relative Spectral Perceptual Linear Prediction (RASTA-PLP) for feature extraction. This process of speaker recognition is enhancing the performance of more features from the speech signals and applying other computation techniques to lead to the improvement of recognition rate and computational technique if noisy speech signal is present, then separating/extracting the original by DWT and Mel -frequency cepstral coefficients (MFCCs)

Keywords:Speaker recognition, voice comparison, Gaussian mixture model, machine learning,discrete wavelet transform (DWT), MFCC

1.INTRODUCTION

In past years, an increasing interest in security systems has arisen. These systems are very useful as they allow managing security in a very efficient way, reducing human resources. Most security systems were implementedby an access control system. In this way,a vast number of security resources by voice commands and speaker recognition in this process of verifyingpeople's identity by their voice. For security purposes, the voice recognition systems are used as a biometric system performance that will allow the control to access in fast response way and low intrusive way and reduced collaboration of people voice samples in comparison

The voice/sound generated by humans is peculiar or different from each other. the voices are generated by vocal tracks. The vocal tracks are consisting of the Oral cavity, nasal cavity, and pharyngeal cavity.

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Speeche Motion Recognition using Deep Learning

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ABSTRACT

Speech emotion recognition has progressed from a specialty to a critical component of Human-Computer Interaction(HCI). These systems strive to make natural human-machine contact easier by using direct voice interaction rather than standard devices as input to understand verbal information and make it simple for human listeners to react. Dialogue systems for spoken languages, such as cell center discussions, onboard car driving systems, and the use of emotion patterns from speech in medical applications are just a few examples. Numerous strategies have been used to extract emotions from signals in the literature of speech emotion recognition (SER), including many well-established speech analysis and classification techniques.The feature extraction and feature classification phases are the most important parts of the speech emotion recognition(SER) process. Researchers have derived several features such as prosodic features, vocal traction features and other hybrid features for speech processing. The second phase includes feature classification using deep learning techniques. These techniques are recently proposed as on alternative to traditional techniques in SER.

KEY WORDS: Feature extraction, prosodic features, vocal traction features, Feature classification, Deep Learning techniques.

1.INTRODUCTION

1.1 Brief information about the project:

The ability to notice, interrupt and respond tosocialinteractions, which is usually assessed through effective expressions is one of the corner stones of human communication understanding emotion expressions can increase the efficiency and complexity of human-machine interaction by improving the processing and responsiveness of automatic emotion detection system, such as robots or experted systems to natural human behavior. If a robot can recognize human emotion expressions, it can change how it interacts with its surroundings. It can increase its problem-solving abilities by incorporating these expressions into a decision-making process. Emotional expression recognition has been a frustratingly tough topic that has drawn a lot of attention in recent years. There is no unanimity intheliterature on how to define emotions, yet features, prosodic features, vocal traction factors and other hybrid features are all examples of hybrid features using linear and non-linear classifiers.

The second phase involves feature classification Bayesian networks (BN) or the maximum likelihood principle (MLP) and support vector machine (SVM) are two of the most often used linear classifiers for emotion reorganization. The voice signal is usually considered non- stationary. As a result, non-linear classifiers are thought to be successful for SER. Deep Learning is a new research subject in Machine Learning that has gotten a lot of interest in recent years. Deep Learning techniques for SER have several advantages over traditional methods, including the ability to detect complex structure and

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Conversion Techniques of Sign and Speech into Text using Raspberry Pi

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ABSTRACT

Every day we see many people facing illnesses like deaf, dumb, etc. They face difficulty to interact with others. Previously developed techniques are all sensors based and they didn't give a general solution. This work explains a new technique of virtual talking without sensors. Web Camera is used to take the image of different gestures and that will be used as input to the OpenCV with Python. The software will recognize the image and identifies the text output which is displayed on the screen. This work explains two-way communications between the deaf, dumb and normal people which means the proposed system is capable of converting sign language and speech into text.

Keywords: Raspberry pi, Sign language, Web Camera.

1.INTRODUCTION

With the rapid development of computer technologies, devices/techniques have become indispensable in our daily lives. Human-computer interactive (HCI) devices such as personal computers, consumer electronics, mobile devices, etc., have also dramatically altered our lifestyle. The ease with which an HCI device can be understood and operated by users has become one of the major considerations when selecting such a device. Therefore, researchers must develop advanced and user-friendly HCI technologies which can effortlessly translate users' intentions into corresponding commands without requiring users to learn or accommodate the device. Many technologies have been developed to intuitively express users' intentions, such as handwriting, human body language, and gestures to naturally control HCI devices. These technologies have many applications in the fields of remote control, virtual reality, sign language, signature authentication, sports science, health care, and medical rehabilitation.

Deaf and Dumb people depend on sign language for communication. A real-time Sign Language Recognition system was designed and implemented to recognize 26 hand signs from the Indian Sign Language (ISL) by hand gesture/sign recognition system for text generation. The hand gestures are captured by using a webcam. These signs are processed for feature extraction using some color models. The extracted features are compared by using a pattern-matching algorithm. To calculate the sign recognition, the features are compared with the testing database. Finally, a recognized gesture is converted into text. This system provides an opportunity for deaf-dumb people to communicate with those who cannot understand sign language without the need for an interpreter.

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IoT Based Parking Slot Detection System using Android Application

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ABSTRACT

With the increase in extent of population in Urban and Metropolitan cities, the problem of parking the vehicles are increasing day by day and it has become a major task to identify the parking spaces in markets, malls and multiplex etc., which consumes the driver's time as well as fuel. If the driver is unable to find any parking space and parks the vehicle in a road side, then the problem of traffic arises. Further, the security of the vehicle is also a major issue. In order to overcome this aspect, in this study, an IOT based parking slot detection utilizing the android application is proposed and reported. Internet technology is utilized so as to connect the physical objects by using a mobile phone with Arduino UNO, sensor's, wi-fi module, cloud database to store the user data. The mobile application acts as an interface between the end user and the system. Infrared (IR) sensor is installed at the parking slot along with Arduino. The sensor is utilized to detect the occupancy or non-occupancy of the parking slot and is updated to the cloud by utilizing Wi-Fi based Internet service. The Arduino is utilized to track the number of vehicles that are parked in the parking area. With the help of this technology, the user can be able to check the availability of the parking space near to him and reserve the parking slot utilizing the mobile application.

Keywords: Arduino UNO, Infrared Sensor, RFID, Servomotor, Wi-Fi

1.INTRODUCTION

In general, every human visit certain places like cinema halls, malls, markets etc., and the one common problem for everyone is parking of vehicles. With the increase in extent of population in Urban or metropolitan cities, the problem of parking the vehicles are also increasing day by day. Identification of suitable parking space has become a tedious task for the vehicle drivers and it consumes more time and also fuel. If the driver is unable to find any parking space and parks the vehicle in a road side, then the problem of traffic arises [1]. Further, the security of the vehicle is also a major issue. In order to solve the problem of parking in urban or metropolitan cities, a smart parking system should be developed and implemented by which the user/driver can be able to park their vehicles. In this study, an IOT based parking slot detection utilizing the android application is proposed and reported. Internet technology is utilized so as to connect the physical objects by using a mobile phone with Arduino UNO, sensor's, wi-fi module, cloud database to store the user data[2]. The mobile application acts as an interface between the end user and the system. Infrared (IR) sensor is installed at the parking slot along with Arduino. The sensor is utilized to detect the occupancy or non-occupancy of the parking slot and is updated to the cloud by utilizing Wi-Fi based Internet

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Recognition of Traffic Sign using CNN

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B Srinivas Raja, K Gayathri, N S R Vivek, B Sai Pavan and D Urekha. Recognition of Traffic Sign using CNN. International Journal for Modern Trends in Science and Technology 2022, 8(S05), pp. 132-135. https://doi.org/10.46501/IJMTST08S0522

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ABSTRACT

TSR (Traffic Sign Recognition) is a technology that allows a car to detect traffic signs placed on the road, such as speed limits, children, and turn-ahead. This is one of the features referred to as ADAS. A number of automobile suppliers are working on the technology.

Traffic sign recognition is an important component of the intelligent transportation system, with promising applications in self-driving cars and driver aid systems. Traditional template matching approach is one of the most used methods for image identification of traffic signs, which is based on the picture properties of traffic signs. Because classification is important in traffic sign recognition, such as with the SVM approach, we are employing the CNN method. The current project will concentrate on traffic recognition.

Keywords: Advanced driver assistance systems (ADAS), Convolution Neural Networks (CNN), max-pooling layer, Fully connected **layer**

1.INTRODUCTION

Humans are getting more reliant on technology in this age of Artificial Intelligence. Multinational corporations such as Google, Tesla, Uber, Ford, Audi, Toyota, Mercedes-Benz, and others are working on automating automobiles thanks to advancements in technology. They're attempting to develop more precise autonomous or self-driving vehicles. You may have heard about self-driving automobiles, in which the vehicle acts like a driver and does not require human intervention to operate on the road. When driving on the road, you will encounter numerous traffic signs such as traffic lights, turn left or right, speed restrictions, no passing of heavy vehicles, no entering, children crossing, and so on, which you must obey in order to drive safely. Similarly, autonomous vehicles must read and make decisions based on these signals. decisions, in order to obtain precision Traffic sign classification, is the process of determining which class a traffic sign belongs to. Traffic sign recognition is an important aspect of intelligent transportation systems because it prevents drivers from missing traffic signs due to a lack of concentration. In the 1970s, traffic sign recognition became popular. With the rapid advancement of technology, it is rapidly gaining the upper hand It catches the attention of vehicle manufacturers and is placed into production. However, today's traffic sign recognition systems can only recognize a limited number of sign kinds. Because of a variety of factors such as weather, camera angles, occlusion, and other variables, recognizing traffic signs is a difficult real-world problem. Traditional traffic sign identification systems start by extracting artificial characteristics such as edge distance, histogram of oriented gradient features, and Haar-like features, among

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Plant Disease Detection and Prevention using Machine Learning

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ABSTRACT

Nowadays, technology is advancing at a rapid pace, and farmers are employing a variety of techniques and technologies to better their farming operations. Plants are the most significant source, and when they are infected with illnesses, it results in food shortages and economic losses. The majority of illnesses are first noticed on the plant's leaves and stems. As a result, image processing and machine learning may help to identify ailments and recommend treatments for them. Using the image extraction process, image processing includes procedures such as image acquisition, image processing, image segmentation, and classification. As a result, the man's main goal is to figure out what is causing the disease in order to save the farmers money. Machine learning is a key component of artificial intelligence that produces outcomes without the need for human intervention. This can be done with Python programming we can get the output extremely accurately and quickly using this project.

KEYWORDS : Agriculture,artificial intelligence,image processing,image acquistion,image segmentation,extraction,machine learning.

1.INTRODUCTION

Agriculture is extremely important in today's society. Plant disease is the leading cause of economic food losses in the agriculture sector around the world. Food losses are caused by a variety of plant diseases, including bacteria, viruses, and fungi. We must take some precautions to reduce the risk of other diseases. It is taking less time to identify cures for those plant ailments these days. Because technology advances at a rapid pace. The most frequent plant disease was discovered by farmers have a lot of experience in agriculture, and they simply use a few basic treatments for those ailments.Farmers, on the other hand, are unable to treat some undiscovered ailments.As a result of these experiments, we can "identify and prevent plant disease using machine learning."Machine learning is the concept that a computer program can learn and adapt to new data without human intervention. Machine learning (ML) is the study of computer algorithms that can learn and develop on their own with experience and data. It is considered to be a component of artificial intelligence. Machine learning algorithms create a model based on training data in order to make predictions or judgments without having to actively do so.

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Location Tracking with Node MCU without using GPS Module

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ABSTRACT

The need for location tracing is vast. GPS (Global Positioning System) is most widely used for location tracing. The Current method of tracing has some issues due to the accuracy of GPS receiver. A GPS receiver needs a clear view of sky to receive information from GPS satellites and weak signal will not provide desired results. Another problem is the size and power consumption. In addition to these issues GPS trackers produce data traffic which adds cost and consume further. This work is based on the geo location API and node MCU ESP 12E board to find the location without GPS module. We propose using serial monitor of Arduino IDE to see the coordinates.

Key words: GPS, geolocation API, Node MCU, location tracking

1.INTRODUCTION

Geolocation is the process of finding, determining and getting the exact location of a computer, networking device or equipment. It helps us to view the device location based on geographical coordinates measurments. Geolocation commonly uses Global Positioning System (GPS) and other related technologies to assess and specify geographical locations. It provides the location of a device but is generally used in variety of applications to help locate human users. Geolocation is a technology that works through a pre-built GPS in a device that propagates the devices longitudinal and latitudinal coordinates. The coordinates are identified on a map to provide a complete address that usually includes a country, city ,town/colony ,building name and street address. In this project we will be using Breadboard Node MCU Google location API in order to track down the most precise geographical location of the entity. The Node MCU component makes the system extremely efficient and user-friendly to work with and implement. We can trace location any device without GPS module only using NodeMCU.

2. LITERATURE SURVEY

Manav Singhal1 , Anupam Shukla2[1]**Implementation of Location based Services in Android using GPS and Web Services** published in international journal of computer science ,from this paper we have learnt the location based services that are present in android through which we can get the location.This paper has working of geolocation API that id being adopted in the proposed design.It has all the location based services that are present in android.

Rumi Juwairiyyah , Kajal Kasat ,Jyothsna Bhushan , Jayaraj[2]**Geolocation using NodeMC**published in

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Robust Estimation of Direction of Arrival (DOA) using Modified Music Algorithm

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ABSTRACT

The direction of arrival (DOA) estimation is a prime issue in Uniform Linear Array (ULA) in array signalprocessing for source localization and tracking. In literature, many works have been proposed for robust DOA estimation, when data gets contaminated with impulsive noise. But, performance of the DOA algorithms also fails to give desired result when one node in an array becomes faulty. In this paper, modified Multiple SIgnal Classification (MUSIC) algorithm in presence of faulty sensor node in ULA is discussed. The performance of the MUSIC algorithm depends on covariance matrix which degrades due to non-gaussian noise. Therefore, in the proposed robust MUSIC algorithm, the covariance matrix is estimated by using Tyler statistical method. The simulation results show that the performance of the proposed robust MUSIC algorithm out performs the conventional MUSIC by providing high probability of resolution (PR)and low root mean square error (RMSE).

KEYWORDS: Direction of arrival, Source localization, Robust technique, MUSIC algorithm.

1.INTRODUCTION

In array signal processing DOA estimation is a hot research area. Since last decades, it is a burning area of research because of real time remote sensing applications like environmental monitoring, source localization, tracking, and remote health monitoring *etc.*

(DOA)estimation is an important problem for source localization and tracking. It is a common problem in radar. In DOA estimation methods, the direction from which a propagating wave arrives at sensor array is estimated. In distributed ULA, the DOA of multiple sources can be estimated by assuming the sensor network as an array. The DOA estimation of multiple emitting sources is an important issue in array processing and has various applications in radar, sonar, wireless communications and source localization [2].

In the literature, many high-resolution sub optimal techniques have been proposed and analyzed, such as Multiple Signal Classification (MUSIC) [3], the minimum variance method of Capon, estimation of signal parameters via rotational invariance technique (ESPRIT) [4] and more. The MUSIC technique is used here because of its superior performance compared to others. The MUSIC algorithm is one of the most widely used high resolution DOA estimation techniques and it is based on subspace methodology [5]. It estimates the DOAs by exploiting the orthogonality between the noise subspace and array manifold [6], [7].

The existing DOA estimation algorithms [8]-[13] assume that all the sensor nodes in an array are fault free. However, in practice, the array elements are subjected to fault due to several reasons. In such case the

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IOT Based Agriculture Robot

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ABSTRACT

Agriculture plays an important role in Indian economy. It provides food, feed and many other products for humans. So, it is a keystone for human existence. On the other hand, robotics plays an important role in the field of agriculture by performing various operations like harvesting, seeding, weeding, ploughing and many more. Agriculture robot is a electromechanical vehicle which is directed by dc motor to drive the vehicles. The purpose of agriculture robot is to perform tasks during initial stage of farming such as ploughing, seeding and water sprinkling. The humidity in the soil is tested by soil moisture sensor. This agriculture robot is controlled via Bluetooth.

Keywords: (Arduino UNO, Motor drivers, Dc Motor, Bluetooth Module, Relay, Battery, Soil moisture sensor)

1.INTRODUCTION

The Internet of Things (IoT) is a network of physical objects called "things" that are equipped with sensors, software, and other technologies in order to connect and exchange data with other devices and systems over the internet.

Agricultural robots are highly specialised pieces of technology that may aid farmers with a variety of tasks. They can evaluate, consider, and carry out a wide range of tasks, and they can be designed to grow and evolve to meet the demands of varied tasks.

The primary purpose of agricultural robots is to automate field activities, allowing farmers to focus on more vital jobs while saving time on mundane tasks. Seeding, harvesting, weed management, tilling, chemical application, and other applications are all possible with these robots.

Most countries in the current generation lack sufficient skilled manpower, particularly in the agricultural sector, which has a negative impact on developing countries' growth. As a result, it is the moment to automate the sector in order to solve this problem. In India, 70% of the population is reliant on agriculture. As a result, we must research agriculture. Our project's innovative idea is to automate the ploughing and sowing of seeds such as sunflower, corn, groundnut, and vegetables such as beans, lady's finger, pumpkin, and wheat seed, among others. To enhance yield while reducing human labour. The ploughing of the field and seed planting are done mechanically with the help of a dc motor.

Microcontrollers are used to control and vary the distance between the two seeds. With the use of remote switches, we can alter the robot's course when it reaches the end of the field. The microcontroller is in charge of the entire procedure. Tractors are used on farms to plough the ground and plant seeds, which is something we do on a daily basis. However, it takes more time, and there is always a manpower shortage. The primary goal

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Advanced Anti-Theft ATM Security using Raspberry Pi

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ABSTRACT

Automated Teller Machines ATMs are used for different ways, mostly cash withdrawals. ATM users utilize many services on ATM and they will do some billions of transactions. Meanwhile robberies occurring in the ATMs are also high with the lack of security. The main objective of our study is to minimize the robberies occurring in the ATM's. For that we have to implement a low cost standalone Embedded Web Server based on ARM11 processor and Linux operating system using Raspberry Pi. This setup is proposed for ATM security, comprising of the modules namely Door lock, web access Wi-Fi, GSM Modem, sensors and camera. Whenever robbery occurs, Vibration sensor is used here which senses vibration and buzzer produced sound alert from ATM machine and takes necessary action. Once the vibration is sensed, information is passed to ARM11 based master device. Then the DC Motor is used to close the door of ATM, a relay will be triggered to leak the gas inside the ATM to bring the thief into unconscious stage, Camera is always in processing and it sends the images to web server and also it will be saved in computer, GSM Modem sends messages to nearby police station and corresponding bank authorities and finally an alarm sound will occurs from buzzer. This will prevent the robberies, and the person involving inthe robbery can be easily carriedout.

Key Words: Automated Teller Machines (ATM) Security, Unauthorized Access, Internet of Things (IoT), Alarm System, Raspberry Pi, Linux OS, Theft Controlling and etc.

1.INTRODUCTION

The Idea of Designing and Implementation of Security Based ATM theft project is born with the observation inour real life incidents happening around us. This project deals with prevention of ATM theft from robberies overcome the drawback found in existing technology in our society.

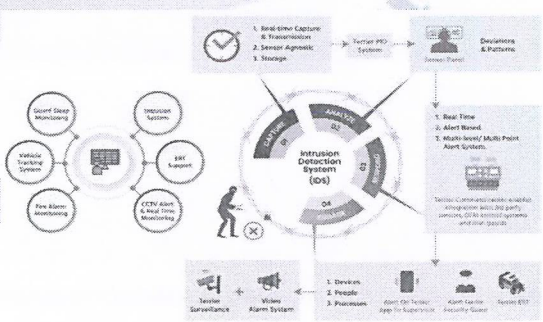

Figure 1: Smart ATM Solutions.

Whenever robbery occurs, Vibration sensor is used here which senses vibration produced from ATM machine. This system uses Arduino controller based embedded system to process real time data collected using the

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Building a Air Canvas using Numpy and Opencv in Python

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ABSTRACT

Writing in air has lately become one of the most interesting and difficult research areas in image processing and pattern recognition. A wide range of human-machine interactions benefit from this technology's inclusion. Numerous researches have investigated new methods and tactics for reducing processing time and improving recognition accuracy. In Computer Vision, object tracking is a crucial part of the task. Object tracking systems have become more popular as a result of faster computers, more affordable and higher quality video cameras, and the increasing need for automated video analysis. Typically, video analysis involves three major steps: identifying the object, tracking its movement from frame to frame, and lastly analyzing its behavior. Object tracking takes into account four issues: object representation, tracking feature selection, object identification, and object tracking. Object tracking algorithms are utilized in a variety of real-world applications, including video indexing, autonomous surveillance, and vehicle navigation. Motion-to-text converters for intelligent wearable electronics that can write in the air are the subject of this study. This initiative serves as a time capsule for transitory movements. It will use computer vision to track the path of the finger. Messages, emails, etc. maybe be sent using the text that has been generated. It will be a great help for deaf individuals to communicate. It's a good way to communicate without having to write.

Keywords:Air Writing, Character Recognition, Object Detection, Real-Time Gesture Control System, Smart Wearable, Computer Vision.

1.INTRODUCTION

For most people nowadays, digital art takes the place of traditional writing as their primary means of expression. We call it "digital art" when we use digital medium to convey our artistic expressions and messages. Digital manifestation is distinguished by its reliance on modern science and technology. There were different kinds of art forms before digital art was created. There are four types of art: visual art, audio art, audio-visual, and audio-visual imaginative. This includes everything from literature to painting to sculpture to architecture to music to dance and theatre. However, digital and traditional creative forms are inextricably intertwined. However, human life's fundamental necessities are the driving force behind societal progress. There is a similar phenomenon in art. The link between digital and traditional art is now so intertwined that we need to study both of them meticulously. The old-school method of writing is when you use a pen and paper or a blackboard. Developing a hand motion recognition system that can be used to digitally write has been the fundamental objective of digital art. It is possible to

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Fake Profile Detection Using Artificial Neural Networks

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ABSTRACT

Social media platform is extremely popular these days and because of it's open nature it leads to increase in cybercrimes, harassments, spam messages through fake accounts so the project focuses on detecting fake accounts on social media using SVM classifier(Support Vector Machine) and Neural Network model. Using a new algorithm that is SVM-NN. Here we are using MIB dataset which is a predefined dataset that consists of a list of features available in social media like the friend-count, request accept count, etc. Like that 16 top categories are the application for everything social media platform. Detecting which activity to perform fake account detection we can't predefine as it will be different for different accounts and social media platforms this issue is getting solved by SVM by selecting which of these activities given by the user that we have taken to identify which account is fake and which not.

KEYWORDS: SVM(support vector machine),SVM-NN,MIB.

1.INTRODUCTION

In 2017 Facebook reached a totalpopulation of 2.46 billion users making it the most popular choice of social media.Social media networks make revenues from the data provided by users. The average user does not know that their rights are given up the moment they use the social media network's service. Social media companies have a lot to gain at the expense of the user. Every time a user shares a new location, new photos, likes, dislikes, and tag other users in content posted, Facebook makes revenue via advertisements and data. More specifically, the average American user generates about $26.76 per quarter [2]. That number adds up quickly when millions of users are involved. In today's digital age, the ever-increasing dependency on computer technology has left the average citizen vulnerable to crimes such as data breaches and possible identity theft. These attacks can occur without notice and often without notification to the victims of a data breach. At this time, there is little incentive for social networks to improve their data security. These breaches often target social media networks such as Facebook and Twitter. They can also target banks and otherfinancial institutions.

2. LITERATURE SURVEY

A social networking service serves as a platform to build social networks or social relations among people who, share interests, activities, backgrounds, or real life connections. A social network service is generally offered to participants who register to this site with their unique representation (often a profile) and one's social links. Most social network services are web-based and provide means for users to interact over the Internet. Nevertheless these sites are also constantly preyed by hackers raising various problems related to threats and attacks such as disclosure of information, identity thefts

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Cloud Based Innovative Agriculture Service System By Using LoRa

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ABSTRACT

The expeditious growth of the Internet and Internet of Things (IoTs), a variety of useful service applications are being deployed in a variety of industries. Innovative agriculture service system is a new agricultural information and communication Technology (ICT) that was developed in recent years to meet the needs of farmers for data gathering, signal processing, data analysis, and equipment control. This paper presents an innovative agriculture service platform based on LoRa Technology and a wireless sensor network. This study uses LoRa as a network transmission interface to solve the communication challenge while also conserving energy. To assist with environmental monitoring and to improve things, an innovative agriculture service platform tool was designed.

KEYWORDS: LoRa, Innovative Agriculture, Cloud, Wireless Sensors.

1.INTRODUCTION

Many people in our modern world make extensive use of technology, and as a result, they are doing their job soon and well. But still, many rural farmers cannot use technology more people are doing so. In addition, due to an increase in the world population, the need for food is increasing. IOT (Internet of Things) tends to create specific techniques in the meantime to increase food production in agriculture field. The farmers can also get useful information regarding the Ph, moisture, water level and soil requirements. So, we are designing this innovative agriculture service system for them.

Farmers can use this method to check the temperature, humidity, and soil moisture, PH value of their farm, which is done by various IOT sensors like Humidity, Temperature, Soil moisture, as well as control various components, like motor, etc. This system is very easy and simple to use, it works wholly on wireless technology. To use this system the farmer has to place the transmitter module in different places in his field with the assistance of this system, and the receiver is placed in his home. Now, the farmer can monitor and operate the system by the website or mobile application.

As previously said, this system is built using wireless technology, which we are already familiar with wireless protocols like Bluetooth low energy, Wi Fi, and cellular, Many people in our modern world make extensive use of technology, and as a result, they are doing their job soon and well. But still, many rural farmers cannot use technology more people are doing so. In addition, due to an increase in the world population, the need for food is increasing. IOT (Internet of Things) tends to create

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Design of 4.4GHz Microstrip Patch Antenna for Drone Application

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ABSTRACT

This paper proposes design of 4.4GHz Microstrip Patch Antenna (MPA). In the design, patches are mounted on Arlon AD270 (tm) substrate having dielectric permittivity. Microstrip Patch Antenna is designed by using edge feeding technique. The VSWR measurement becomes zero at 4.4GHz resonant frequency. The Bandwidth, Quality factor and some other parameters are more efficient compared to other techniques. This project helped us to achieve 95% of efficiency.

KEYWORDS: Microstrip Patch Antenna, 4.4GHz, Edge Feed, HFSS Simulation Software

1.INTRODUCTION

Antennas are key components of any wireless system . An antenna is a device that transmits and/or receives electromagnetic waves. Most antennas are resonant devices, which operate efficiently over a relatively narrow frequency band. An antenna must be tuned to the same frequency band that the radio system to which it is connected operates in, otherwise reception and/or transmission will be impaired. The receiving antenna as a part in the system is responsible of turning the electromagnetic waves into its original form (electrical signal in wire). The properties of the transmitting and receiving antennas are fully represented by Maxwell's equations. The dipole antenna was the first type of antenna to be ever used and the simplest one to study and understand, it is a straight wire fed from the center. To tune the wire to be effective to transmit and receive electromagnetic waves, the length of it should be half the wavelength of the operating frequency. We can say that antennas are the backbone and almost everything in the wireless communication without which the world could have not reached at this age of technology.

2. MICROSTRIP PATCH ANTENNA

Microstrip antenna (also known as a patch antenna) is one of the latest technologies in antennas and electromagnetic applications. It is widely used now days in the wireless communication system due to its simplicity and compatibility with printed circuit technology. Microstrip geometries which radiate electromagnetic waves were originally contemplated in the 1950s.

The concept of microstrip antenna was first proposed by Deschamps in the year 1953. Gutton and Baissinot presented a patent in on the microstrip in the year 1955. Early microstrip lines and radiators were specialized devices developed in laboratories. No commercially

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VLSI Implementation for High Performance Encoder of Flash ADC

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ABSTRACT

The fastest analog to digital converter, commonly known as parallel ADC, is the flash ADC. It is perfect for applications that require a lot of bandwidth. A resistor ladder, comparator, and encoder circuit make up the circuit. The comparator's output is a thermometer code. It must be translated to binary code using the appropriate encoder. When building a low-power Flash ADC, reducing encoder power consumption is a primary concern. The Wallace tree encoder and MUX based encoder, are compared in this research. The Wallace tree encoder can overcome the problem of bubble error but it consumes more power. The multiplexer based encoder is more power efficient and simple in design.So, it is more suitable for low power flash ADC. These encoders are implemented by using Xilinx Vivado 18.1

Keywords – Flash type ADC,Parallel ADC, thermometer code, encoder, power dissipation, Low power, High speed.

1.INTRODUCTION

A flash type ADC, often known as a parallel A/D converter, is the simplest to comprehend. It is made up of several comparators, each of which compares the input signal to a different reference voltage. The comparator outputs are connected to the priority encoder circuit's inputs, resulting in a binary output. The Fig1 illustration shows a 3-bit flash ADC circuit:

Vref is a stable reference voltage provided by a precision voltage regulator, which is not depicted in the schematic, as part of the converter circuit. The comparator outputs will sequentially saturate to a high state as the analogue input voltage surpasses the reference value at each comparator. The priority encoder creates a binary number from the highest-order active input while ignoring all other active inputs.

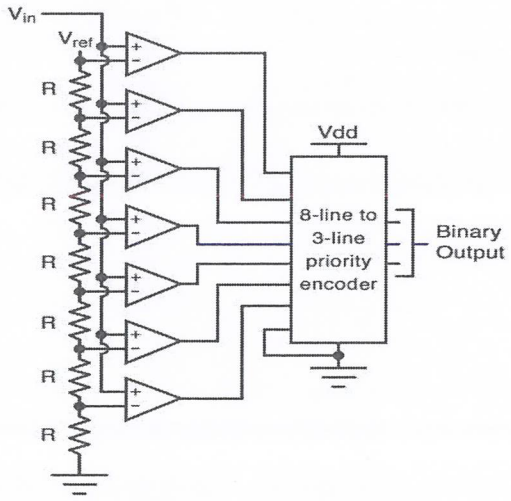

Fig 1: 3-bit flash ADC circuit

Because of the nature of sequential comparator output states (each comparator saturating "high" in order from lowest to highest), the same "highest-order-input

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Efficient and Low Density Based Binary Counters and Compressors

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To Cite this Article

V. Naga Bindhu, Biswaranjan Barik and K Madhu Krishna. Efficient and Low Density Based Binary Counters and Compressors. International Journal for Modern Trends in Science and Technology 2022, 8(S05), pp. 193-196. https://doi.org/10.46501/IJMTST08S0536

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ABSTRACT

To perform the summation of multiple operands at the same time is the critical path in various DSP units. To speed up the summation exact/approximate compressors are necessary. In this paper, we present a novel method of efficient and low density based binary counters and compressors and also show the comparison of Exact (4:2) compressor and Approximate (4:2) compressor with one error using the sorting network which comprises basic logic gate along with multiple input and output. The major objective is to reduce the power consumption. This was implemented by using Xilinx Vivado 18.1.

Vivado Design Suite is software suite produced by Xilinx for synthesis and analysis of hardware description language (HDL) designs. Vivado includes the in-built logic simulator. Specifically the Xilinx Vivado compiler provides a programming for optimization of C and C++ programs. Vivado simulator is a mixed language simulator and can handle simulation models in both VHDL and Verilog.

Keywords: Exact and approximate compressor, sorting network, Lookup table, Power Dissipation.

1.INTRODUCTION

The summation of multiple operands is widely used in many digital signal processing units and is one of the critical paths. One of the methods is by using the compressor combined by full adder.

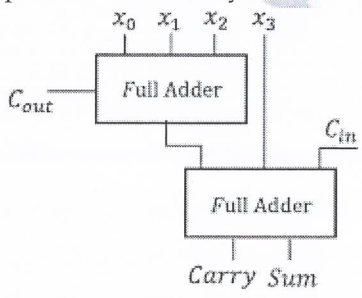

Fig 1:(4:2) compressor by full adders.

The basic multiplier circuit adds all the small products with the Wallace tree structure where this method use full adders as counters to accelerate the summation. For example, a basic (7, 3) counter structure combined with full adders is shown in fig2. Also the compressors compress n rows into 2 rows by considering the carry bits between adjacent columns which are still in the frame work of full adders. The counters compress n rows into _log2n_ rows.

A STUDY ON WAGES AND SALARIES ADMINISTRATION (WITH REFERENCE TO SHELTON HOSPITALITY AT RAJAMAHENDRAVARAM EAST GODAVARI, AP)

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ABSTRACT

The project is aimed at examine the effectiveness of wage and salaries administration in **SHELTON HOSPITALITY , RAJAMAHENDRAVARAM.**

Wage and salary administration is defined as the process by which wage and salary levels and structures are determined in organizational settings. Wages are payments for labour services rendered frequency, expressed in hourly rates, while a salary is a similar payment, expressed in weekly, monthly or annual rates.

The primary data collected through questionnaire and opinion survey method. Secondary data collected through books, company website, internet. All respondents are enjoying the benefits of wages and salaries and other facilities also that are provided by the SHELTON HOSPITALITY.

Key words: Wages and salaries, payment, organizational & data.

***P.SAI KRISHNA ,Pursuing MBA final year**

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AN ARTICLE ON RECRUITMENT AND SELECTION PROCESS AT AP PAPER MILL, KADIYAM. EASTGODAVARI, ANDHRAPRADESH.

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ABSTRACT

The present study of research "AN STUDY ON RECRUITMENT AND SELECTION PROCESS IN AP PAPER MILL KADIYAM". The entire research was supported by data given by employees of and data gathered from official website. There search includes the process starting from recruitment and selection of person for a job through various stages of recruitment and selection process.

Enrolment Recruitment is "recruiting" of workers from outside. "It is the way toward finding and drawing in proficient candidates for business. The cycle starts when newcomers are looked for and closes when their application are submitted. The outcome is a pool of candidates from which new workers are chosen."

Determination Selection is a negative interaction and includes the disposal of competitors who don't have the necessary abilities and capability for the work proposed. Likewise, it is an of separating between candidates to recognize and employ those with more note worthy probability of achievement in work. The goal of choice is to pick the person who can most effectively play out the work from the pool of qualified applicants.

AN ARTICLE ON RECRUITMENT AND SELECTION PROCESS AT AP PAPER MILL, KADIYAM. EASTGODAVARI, ANDHRAPRADESH.

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ABSTRACT

The present study of research "AN STUDY ON RECRUITMENT AND SELECTION PROCESS IN AP PAPER MILL KADIYAM". The entire research was supported by data given by employees of and data gathered from official website. There search includes the process starting from recruitment and selection of person for a job through various stages of recruitment and selection process.

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A STUDY ON
RECRUITMENT AND SELECTION
WITH REFERENCE TO MY COMPANY AT VISAKHAPATNAM, AP.

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ABSTRACT

A study on recruitment and selection in mine and yours company, visakhapatnam. The entire data was supported by the employees in the company. In any kind of organization, recruitment and selection processes are considered more important, because they help in getting most suitable candidates for the jobs. It is the best use of employees strength in order to fulfil the goals and objectives of the company. Recruitment is the process of screening and shortlisting and selecting the right candidates for the job vacancies. The main focus of these aspects is to improve the knowledge and skills of the employees that is necessary in achievement of the**"MY company", Visakhapatnam** goals and also personal goals .The main purpose of this research "**MY company**" is to acquire the understanding of recruitment and selection. The main areas that have been included objectives of recruitment and selection, methods of recruitment and selection, process of recruitment and selection types of recruitment, types of interview, benefits of recruitment and selection programs.

Key words: Recruitment , selection, goals , skills , achievements , knowledge

***CH. Srilekhya, pursuing MBA Final Year**

****Dr. M. Vijay Kumar, Professor and head of the department**

A ARTICAL ON EXHIBITING ASSESSMENT SYSTEM OF EMPLOYEES (WITH REFERENCE TO CHODAVARAM CO-OPERATIVE SUGAR LIMITED, ANAKAPALLE)

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ABSTRACT

Performance appraisal (PA) is a crucial technique for improving the skills of employees and organizations. Organizations have implemented performance appraisal to monitor and supervise relationships, growth, and development of individuals and organizations to increase overall productivity and job satisfaction. The human resource department is tasked with employee recruitment, selection, and retention. Retaining personnel, particularly those who are talented and competent, has become a major challenge. Motivation initiates, guides, and maintains an individual's goal-oriented behavior. Employee retention is mostly determined by motivation. To inspire and retain employees, Performance Appraisal guidelines are used to assess workers, develop their competence, improve their performance, and issue awards. The focus of this research is on a survey of several performance appraisal systems used in organizations and the need of training. This paper analyses the literature findings on objectives /techniques of exhibiting assessment. Performance Evaluations are much too infrequent to be meaningful, and others claim that they do more harm than good in general, which defines the type of data link between the company and the employees, as well as the immediate impact in this paper.

KEYWORDS: Performance Appraisal, Organization, Employee satisfaction.

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****MRS.CH.NAGESWARI , ASSISTANT PROFESSOR,DMS**

THE IMPACT OF ROAD-TO-SUCCESS WORKSHOP ON EMPLOYEES PERFORMANCE

(Special reference with OMNICEUTICS , HYDERABAD,TELANGANA)

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ABSTRACT

Human Resources are the important aspect in supporting the sustainability of the business activities in the company. A company can increase work productivity if there is good cooperation and a reciprocal relationship between the company's management and its employees. The objectives of the study are to evaluate and assess of the training needs as HRD programs and its impact on individual and organizational performance. Training is a systematic development of knowledge, skills and attitudes required by employees to perform adequately on a given task or job. Training and development are required for staff to enable them work towards taking the organization to its expected destination. The result of the study shows that why training and development is essential for employees and how it is effect on individual and organizational performance.

***Key words*:** Training, development, organization, employee, increase work productivity and performance.

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**Mrs. CH. NAGESWARI,ASSISTANT PROFESSOR

A STUDY ONTRAINING AND DEPLOYMENT

(With special reference to WESTLISOFT TECHNOLOGIES PVT Ltd, HYDERABAD, TELANGANA.)

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ABSTRACT

The study was carried out to analyse the extent of effectiveness of training and deployment practices for knowledge and skill enhancement of the employees working in WESTLISOFT TECHNOLOGIES Pvt Ltd Hyderabad. The data were collected from randomly selected 100 employees. Working in department of WESTLISOFT TECHNOLOGIES. Practical training has been made integral part of the management education in India. The summer training programmers are designed to give a manager the future of the corporate happenings and work culture. Personnel management is that part of management concerned with the people at work and with their relationships within the organization. Training is the process of increasing the knowledge and skill for doing a particular job. It is an organized procedure by which people learn knowledge and skill for a definite purpose. The purpose of training is basically to bridge the gap between job requirements and present competency of an employee.

Every organization needs to have well trained and experienced people to perform the activities that have to be done. It is necessary to raise the skill levels and increase the versatility and adoptability of employees. Employee training and development are not only an activity that is desirable but also an activity that an organization must commit resources to if it is to maintain a viable and knowledgeable work force.

KEYWORDS: Training, Development, Organization, Effectiveness.

AN ARTICLE ON TRAINING AND DEVOLOPMENT AT ANDHRA PAPER LTD, KADIYAM , ANDHRA PRADESH.

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ABSTRACT

Training and development are regarded as imperative areas in the case of human resource management. In every PAPER MILL, training and development functions is given utmost significance. They are connected to the business objectives and performance, they are an essential part of the paper mill, they are focused on setting tangible objectives for the employees and they are an integral part of the paper mills policy. The main focus of these aspectsis to improve the knowledge and skills of employees that is necessary in the achievement of paper mill goals as well as personal goals of employees. The main purpose of this research paper is to acquire adequate understanding of training and development. The main areas that have been taken into account include, objectives of training and development, stages in the training and development process, methods of training and development, types of training, the need for analysis and assessment in training, trainers, and benefits of training and development programs.

KEYWORDS: Training, development, management, achievement, goals, skills, knowledge.

AN ARTICLE ON FINANCIAL PERFORMANCE USING CAPITAL BUDGETING AT SANGAM DAIRY AT VADLAMUDI, GUNTUR, ANDHRA PRADESH.

AUTHOR: 1) V. ANIL KUMAR, II MBA
AUTHOR: 2) R. RAJA, ASSISTANT PROFESSOR

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ABSTRACT:-

The existing observes of the studies entitled "an article performance using CAPITAL BUDGETING AT SANGAM DAIRY". The examination turned into support by way of secondary data from information, reviews, and profiles of the organization. The strength of any research is based on the regular information collection approach. Capital budgeting is a way of analyzing and evaluating giant future investments and expenses to decide which of them are most worthwhile. Capital budgets or capital expenditure budgets are away for an employer's management to devise constant asset sales and purchases. Normally, those budgets assist management to examine exceptional lengthy-term techniques that the employer can take to attain its development dreams.

Keywords: Payback period, Internal Rate of Return, Net Present Value.

INTRODUCTION:-

- The phrase finance came initially from a French phrase.
- In the 18th century, it becomes modified with the aid of English-speaking communities to mean "the management of cash."
- Finance is nothing however a change of handy assets. Finance isn't limited best to the alternate and/or administration of money. A barter buying and selling machine is likewise a form of finance.

AN ARTICLE ON FINANCIAL PERFORMANCE USING THE FUNDS FLOW ANALYSIS AT LINERS INDIA LIMITED AT VIJAYAWADA,KRISHNA DISTRICT,ANDHRA PRADESH.

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ABSTRACT:

The present study of the research entitled "**AN ARTICLE ON FINANCE PERFORM USINGTHE FUNDS FLOW ANALYSIS AT LINER INDIA LIMITED** ".A Funds flow statement is a summary of a firm's inflow and outflow of funds. It tells us from where funds have come and where funds have gone. Funds flows statement can whether sources of funds and their views matching or otherwise financing and investment decisions. The financial statement of the business indicate assets, liabilities and capital on particular date and also the profit loss account during a period. But it is possible that there is enough profit in the business and the financial position is also good and still there may be deficiency of cash or working capital in business therefore a statement I prepared of the sources and applications of funds from where working capital comes and where it is utilized. This is called funds flow statement. The funds flow statement or statement of changing in financial position is a statement of flows, It measures the changes that have taken place during two balance sheet dates.

AN ARTICLE ON HUMAN RESOURCE MANAGEMENT USING THE INDUSTRIAL RELATIONS AT ANDHRA PAPER LIMITED (KADIYAM UNIT), EAST GODAVARI, ANDHRA PRADESH.

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AUTHOR: 2) DR.PRK RAJU,DIRECTOR
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ABSTRACT

The main aim of the project is examining the effectiveness of Industrial Relations in Andhra paper Limited Kadiyam. Industrial Relations provide a comprehensive coverage of the various aspects like conceptual foundations, industrial structure and policy framework, role of government and trade unions. It also discusses trade unions, collective bargaining, and tripartism and highlights the importance of dispute resolutions, labour administration, grievance handling and the management of industrial relations. This edition also gives a detailed coverage of various labour laws and its impact on industrial relations Industrial relations is the study of employee-employer relationship. The basic thrust of the discussion is to examine the relationship between the management, workers and the trade unions representing the firm's workforce .The pro-active industrial Relations can be developed through implementation of the cooperate goal and business alignment with the functional goal and strategy. Increase awareness of the employee about the objectives of the company, who are the customers and their requirements.

The feedback that is taken from employees is useful for implementing further. The intervention of the integrate HR for top to bottom employees and develop the ownership culture and train committed work force as per industry needs so that they able to fight with the competition. Regular dialogue with the trade union leader or opinion maker and convince them for re –orientation of their aims from destructive to constructive approach and style to suit the changing situation.

Key Words: Collective Bargaining ,Industrial Relations ,Industrial Structure ,Trade unions,GrievanceHandling.

AN ARTICLE ON TRAINING AND DEVELOPMENT WITH REFERENCE TO NEXUS FEEDS LIMITED AT BHIMAVARAM, EAST GODAVARI, ANDHRA PRADESH

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ABSTRACT:

The present study of the research entitled "AN ARTICLE ON TRAINING AND DEVELOPMENT WITH REFERENCE TO NEXUS FEEDS LIMITED Organization and individual should develop and progress simultaneously for their survival and attainment of mutual goals. So every modern management has to develop the organization through human resource development. Employee training is the important subsystem of human resource management. Training is the act of increasing the knowledge and skills of an employee for doing a particular job. Training is a short-term educational process and utilizing a systematic and organized procedure by which employees learn technical knowledge and skills for a definite purposeIn other words training improves, changes, moulds the employee's knowledge, skill, behaviour, aptitude, and attitude towards the requirements of the job, and organization. While the former refers totraining given it employees in the areas of operations, technical and allied areas, the latter refers to developing an employee in the areas of principles and techniques of management, administration, organization and allied area. This paper aims to attempt the need of training and development programmes in respective organization and examine the methods and evolution of training programmes was discussed.

Key Words: Employees, Development, Job, Methods, Programmes, Skills Training

AN ARTICLE ON HUMAN RESOURCE MANAGEMENT USING THE PERFORMANCE APPRAISAL AT ANDHRA PAPER LIMITED AT KADIYAM, EAST GODAVARI, ANDHRA PRADESH.

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GODAVARI INSTITUTE OF ENGINEERING&TECHNOLOGY(AUTONOMOUS), RAJAMAHENDRAVARAM, ANDHRA PRADESH, INDIA.

ABSTRACT

The most common person to undertake a performance assessment is a direct manager, such as a line manager or a front-line manager (Tyskbo, 2020]) Annual performance reviews have been criticised for not offering enough feedback (Evans &Tourish, 2017).Performance evaluations are much too infrequent to be meaningful, and others claim that they do more harm than good in general. which defines the type of data link between the company and the employee, as well as the immediate impact in this case.

INTRODUCTION

Association and individuals ought to create and advance at the same time for their endurance and accomplishment of their shared objectives. So present-day executives ought to build up the association through human resource improvement. Execution evaluation is the significant sub-arrangement of Human Resource Development, which helps in achieving the association advancement and their common objectives. Evaluating the presentation of an individual, bunch and the associations is the normal act, everything being equal. The instructors assess the exhibition of the understudies, financiers assess the presentation of the loan bosses, guardians assess the conduct of the youngsters and we all persistently assess our own behaviour every now and then.

AN IMPACT ON EMPLOYEES TOWARDS TRAINING AND DEVELOPMENT AT ANDHRA PAPER LIMITED AT KADIYAM, EAST GODAVARI, ANDHRAPRADESH.

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ABSTRACT

The purpose of this paper is to present a conceptual study established on the employee training and development program and its benefits. This paper will inspect the structure and elements of employee training and development program and later the study present what are the positive outcomes for employees and organizations. Organizations find it difficult to stay competitive in recent global economy. Importance of employee development program is growing for the organizations those pursuing to receive an advantage among competitors. Employees are esteemed resource of the organization and success or failure of the organization relay on the performance of employees. Therefore, organizations are financing large amount on employee training and development programs. Furthermore, in training program it is supportive for companies to emphasis on knowledge, expertise and ability of employees. There is substantial discussion among professionals and researchers on the affect that development program has on both employee and organization. The study described here is a vigilant assessment of literature on fundamental of employee development program and its benefits to organizations and employees.

Keywords: Training design, training component, training benefits

INTRODUCTION

Management of Human Resources, as a subject of study even though of relatively recent origin- the concept upon which the theory is based –dates back to 400 B.C. The Chinese as early as 1650 B.C had originated the 'Principle of Division' of labour (specialization). The 'span of management' and the related concepts of organization were well understood by Moses around

AN ARTICLE ON RECRUITMENT AND SELECTIONAT ANDHRA PAPER LIMITED AT RAJAHMUNDRY, EAST GODAVARI ANDHRA PRADESH

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ABSTRACT

.In the current investigation of the examination named "AN ARTICLE ON RECRUITMENT AND SELECTION AT ANDHRA PAPER LIMITED" Effective enrollment, choice and maintenance are basic to authoritative achievement. They empower organizations to have performing workers Who are happy with their positions, along these lines contributing emphatically to the organization.On the opposite. Insufficient enrollment philosophy. Determination and maintenance Would bring about bungles which can have adverse results for an association. A loner who isn't in line with the association's ways of thinking and objectives can decrease yield, efficiency, consumer loyalty, relationship, and generally speaking nature of work. Preparing an off-base recruit can likewise be costly. Successful enlistment is along these lines the initial move towards authoritative greatness as well as is a significant expense control component too

The study researches the spectrum of recruitment methodologies followed in an IT company towards developing a unique model, propose suggestion that would reduce cost, time to recruit, be effective and help overall organizational interests

INTRODUCTION

Today, in every organization personnel planning as an activity Is necessary. It is an important part of an organization. Human Resource Planning is a vital ingredient for the success of the Organization in the long run. Certain ways are to be Followed by every organization, which ensures that it has the right number and kind of people, at the right place and right time, so that the organization can achieve its planned objective.

AN ARTICLE ON RECRUITMENT AND SELECTION PROCESS AT SRI RAMADAS PAPER BORDS PVT.LTD, AT JEGURUPADU, EAST GODAVARI,ANDHRA PRADESH

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I.ABSTRACT

Business entities have been focusing more on human capital over the last decade since it is the most valuable and treasured asset.Organizations should carefully map required human resources when hiring applicants because they provide a competitive advantage. For many organizations, the term recruiting has come to represent a logistical approach to human resource capital. As a result of the entry of multinational corporations, businesses are advancing new hiring and selection processes.

The aim of this article is to investigate Sri Ramadas Paper Boards Private Limited's recruitment and selection procedures. Organizations with the greatest human resource availability gain a strategic edge and become the organizations' lifeblood. The aim of this study is to conduct a literature review of the procedures used in organizations for recruitment and selection. Both primary and secondary data were used in the study. A questionnaire was used to gather primary data from 100 workers. The percentile approach was used to achieve the data. The percentile approach was used to achieve the data. According to the results of the study, Sri Ramadas Paper Boards Private Limited employs the best recruiting and selection practices, and employees are pleased with the organizational environment and ethical recruitment policies.

Keywords: Employees, recruiting, selection, recruitment policy, organizational environment, and ethical principles

A STUDY ON

"TRAINING AND DEVELOPMENT"

(With Special Reference to Bharat Sanchar Nigam Limited)

RAJAHMUNDRY, ANDHRA PRADESH

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ABSTRACT

Training and development policy of the organization considered to be one of the essential determinants of effectiveness of the human resource management.

Training is a process of learning a sequence of programmed behavior is application of knowledge. It improves their performance on the current job. This process starts after candidates got selected. Training makes the employees adoptable to operations. Training helps employees to acquire new skills, problem solving etc,

Development is a related process to training. It covers not only those activates, which improve job performance of the employees but also those which bring out growth of personality. Development helps employees in the progress towards maturity and actualization of their potential capacities, also for controlling their emotions. Development is a systematic effort affecting individuals' knowledge or skills for the purpose of personal growth or future jobs for employees.

This study shows that employees under this organization feel that training helps to improve team building, the employees in this organization feel that training and developing activities help to maintain employee retention rate.

The employees under this organization are satisfied with the training and development programs given by the organization.

KEY WORDS: -Training, Development, employees, performance, growth.

1. INTRODUCTION:-

A STUDY ON
REWARDS AND RECOGNITION PROCESS
(With special reference to Hindustan Unilever Ltd, Dowleswaram East Godavari District-AP)

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Abstract

The study's goal is to see how incentives and recognition affect employee motivation at HINDUSTHAN UNILEVER LIMITED, RAJAHMUNDRY.

Human resource management includes the notion of rewards and recognition. The research examines the behavioural differences between appreciated and unappreciated workers in order to determine if motivation improves employee performance in the direction of corporate development and whether incentives and recognition lead to emotional conflicts among employees. For this study, a descriptive research approach was used. The responders were a group of HUL workers. Employee motivation and satisfaction are influenced by a range of variables, according to the research.

The primary data collected through questionnaire and opinion survey method. Secondary data collected through books, company website, and internet. All respondents are enjoying the benefits of welfare measures and other facilities also that are provided by the Hindustan Unilever limited.

Key words: Rewards, Recognition, Employee Motivation and Satisfaction

REVIEW ON LABOUR WELFARE AT INTERNATIONAL PAPER APPM LIMITED,

KADIYAM,EAST GODAVARI, ANDHRA PRADESH.

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ABSTRACT

Labour welfare is a comprehensive term including various services, benefits and facilities offered to employee. Through such generous measures the employer makes life worth living for employees. The welfare amenities are extended in addition to normal wage and other economic rewards available to employees as per the legal provision. The basic purpose of employee's welfare is to enrich the life of employees and keep them happy and contented.

Welfare including anything that is done for the comfort and improvement of employees and is provided over and above the wages. Welfare helps in keeping the morale and motivation of the employees high so as to retain the employees for longer duration. The welfare measures need not be in monetary terms only but in any kind/forms. Labour welfare includes monitoring of working condition, creation of industrial harmony through infrastructure for health, industrial relations and insurance against disease, accident and unemployment for the workers and their families.

Labour welfare entails all those activities of employer, which are directed towards providing the employees with certain facilities and services in addition to wage or salaries.

Keywords: Welfare, Working condition, improvement, facilities.

A STUDY ON EMPLOYEE MOTIVATION WITH REFERANCE TO APARNA ENTERPRISES LIMITED, PEDDAPURAM, EAST GODAVARI,ANDHRA PRADESH.

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ABSTRACT

Employee motivation starts with the recognition that individuals can only perform at their best in an atmosphere that satisfies their fundamental emotional needs for acquisition, bonding, understanding, and defending. Harvard Business School professors Nohria and Groysberg, as well as Centre for Research on Corporate Performance researcher Lee, all agree.

Employee surveys at various Fortune 500 and other organisations were used to establish a strategy for dramatically increasing workplace motivation.

Companies and frontline managers may use a variety of organisational levers to better satisfy the requirements of their employees, according to the authors. The urge to acquire is fulfilled by reward systems that actually respect excellent performance.

The greatest way to foster a sense of community is to provide an environment where people are encouraged to work together and share ideas. The urge to understand is met by jobs that aim to be both relevant and difficult. Fair, trustworthy, and transparent processes for performance management and resource distribution meet the desire to defend.

AN ARTICLE ON RECRUITMENT AND SELECTION AT SPENCERS LIMITED PEDDAPURAM, ANDHRA PRADESH.

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ABSTRACT: -

The present study of research "AN ARTICLE ON RECRUITMENT ANDSELECTION PROCESS INSPENCERS LIMITED".The entire research was supported by data given by employees of SPENCERS and data gathered from APARNA ENTERPRISES, official website. The research includes the process starting from recruitment and selection of a person for a job through various tages of recruitment and selection process.

Enrolment Recruitment is "recruiting" of workers from outside. "It's a strategy for attracting and retaining qualified business candidates. An immigration cycle starts with a search for newcomers, and finishes with the submission of their application. New staff might be selected from a growing pool of qualified candidates as a consequence.

Determination Selection is a negative interaction in which competitors who lack the requisite qualities and capacity for the task presented are eliminated. As with sorting candidates, it is a method for identifying and hiring those with a better likelihood of success in the workplace.The purpose of selection is to choose the individual from a pool of competent candidates who can best carry out the task.

AN ARTICLE ON HUMAN RESOURCE MANAGEMENT USING THE RECRUITMENT AND SELECTION AT ANDHRA PAPER LIMITED (KADIYAM UNIT), EAST GODAVARI, ANDHRA PRADESH.

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ABSTRACT:

The present study of the research is "AN ARTICLE ON HUMAN RESOURCE BY USING THE ANDHRA PAPER LIMITED 'KADIYAM UNIT' ". Effective recruiting and hiring processes are critical factors at the human resource entry point of every enterprise. Effective recruiting and evaluation practices lead to better workplace outcomes. The primary goal of this paper is to define common strategies used by companies to hire and select workers. In light of this, a research paper titled Recruitment and Selection has been prepared to shed light on the Recruitment and Selection process. Organizations must adapt quickly to people's requirements in today's constantly evolving market world. As a result, it is important to have a well-defined recruitment strategy in place that can be easily implemented to find the right candidates for open positions. The company can incur significant costs if the wrong candidate is chosen or the right candidate is rejected.

Keywords: recruitment process, recruitment processes, recruitment channels, selection process, methods, and selection criteria.

INTRODUCTION:

HRM is the study of sports associated with individuals who work in an employer. It is an administrative function that attempts to fit the desires of businesses with the abilities and skills in their personnel.

Human resource management (HRM) will be management that involves hiring, motivating, and preserving human beings within an organization. It is centered on businesses, friends. Human

A STUDY ON FUND FLOW ANALYSIS WITH SPECIAL REFERENCE TO APARNA ENTERPRISES LIMITED,PEDDAPURAM, EAST GODAVARI DISTRICT, ANDHRA PRADESH.

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ABSTRACT:

Working capital is the main source of finance that is required to run the day-to-day operations of the business. It is obtained by taking the difference between Current Assets and Current Liabilities. This paper examines the inflow and outflow of funds of Aparna enterprises with the help of financial statements. The flow of Funds or Fund Flow refers to the changes in the current assets and current liabilities that result in working capital. The main purpose of the study is to analyze the financial operations, budget comparison and also to know the financial consequences that result in failure of payments. Fund flow statements and statements showing changes in working capital are used for the study. The results suggest that a net increase in working capital and Funds from Operations has a positive impact that helps the shareholders or the investors to invest in company shares. The study found out that the company has an increasing trend in working capital. It also found that the company has higher sources of funds to maintain the financing and investing activities. The Fund Flow statement of the company enables the potential investors to predict the company's future share value and efficiency of management accordingly.

Keywords: Working capital, Flow of Funds, Current Assets, Current Liabilities, Funds from Operations.

INTRODUCTION:

Financial statements such as Balance sheet, Profit and Loss account and trading account are used to measure the financial performance, profitability, operational efficiency and trading performance. Purchasing, allocating, and monitoring financial resources are some of the primary concerns of financial management.

"A STUDY ON PERCEPTION OF INVESTORS TOWARDS STOCK MARKET IN EAST GODAVARI DISTRICT"

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Abstract:

The developments in the financial markets around the globe are providing a wide variety of markets and investment options to the investors. This in turn makes the investment decision process more complex. Research has been done to identify the factors influencing the investors attitude towards investment. Primary data is collected through questionnaire. The average value of the top five highly influential factors according to the investors were what the company does, valuation of the company Stock, companys10-Q annual reports, Price to earnings ratio is the company profitable. The five factors which were given lowest priority or which had low influence on the attitude of the retail investors investing in equity stocks were Revenue/profit patterns of the company was considered to be the lowest influencing factors among the five, customer/client reviews about the company, vision and mission of the company, risk factors involved in the nature of business, debt-to-equity ratio.

Keywords: Investment, investors attitude, influencing factors

INTRODUCTION

Capital market development has been closely related to an economy overall development. As economy develops, the indirect lending by savers to investors tends to become more efficient. As economy grows further, specialized financial intermediaries and securities markets develop.

A STUDY ON JOB SATISFACTION AND ITS EFFECT ON THE PERFORMANCE OF EMPLOYEES WORKING IN TELECOM SERVICES

(with special reference in Airtel ltd, Rajahmundry)

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ABSTRACT

Job satisfaction refers to one's feelings towards one's job. If the employee's expectations are fulfilled or the employees get higher than what he/she feels satisfied. If job satisfaction increases organization commitment will increase. This results in higher productivity. The main objectives of this paper are to assess job satisfaction to identify the effectiveness of job satisfaction and to find out the several factors like personal and organizational factors influencing job satisfaction to identify the effectiveness of job satisfaction and to find out the several factors like personal and organizational factors influencing job satisfaction of employees. In this study employee, respondents have been taken as a sample. The study helped in revealing the level of satisfaction of employees with reference to the various factors provided in the organization. This study clearly shows that employees under the organization are more or less satisfied with the job. The organization should consider the salary, relationship of employees and supervisors, grievance handling, and give more opportunities for the new employees.

Keywords:- Job satisfaction, Organization, Employee, Job.

AN ARTICLE ON RECRUITMENT AND SELECTION PROCESS IN GAS AUTHORITYINDIA OF LIMITED (GAIL) AT RAJAHMUNDRY.

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ABSTRACT

The present study of research "AN ARTICLE ON RECRUITMENT AND SELECTION PROCESS IN GAIL". The entire research was supported by data given by employees of Gail and data gathered from Gail official website. The research includes the process starting from recruitment and selection of person for a job through various stages of recruitment and selection process.

Enrolment Recruitment is "recruiting" of workers from outside. "It is the way toward finding and drawing in proficient candidates for business. The cycle starts when newcomers are looked for and closes when their application are submitted. The outcome is a pool of candidates from which new workers are chosen."

Determination Selection is a negative interaction and includes the disposal of competitors who don't have the necessary abilities and capability for the work proposed. Likewise it is an interaction of separating between candidates to recognize and employ those with more noteworthy probability of achievement in work. The goal of choice is to pick the person who can most effectively play out the work from the pool of qualified applicants.

INTRODUCTION

RECRUITMENT AND SELECTION

Recruitment is the process of finding and attracting capable applicants for employment.

Recruitment and selection process is concentrates at the identification of maximum source of

human resource personnel and acquire that source.

AN ARTICLE ON FINANCIAL STATEMENT ANALYSIS AT AVANTHI FEEDS LIMITED AT KOVVUR, WEST GODAVARI, ANDRA PRADESH.

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ABSTRACT:

Financial statement analysis could be a methodology of reviewing and analyzing company's accounting reports, so as to determine its past, present or projected future performance. This method of reviewing the money statements permits for higher economic deciding. Globally, in public listed firms area unit needed by law to file their money statements with the relevant authorities. as an example, subject matter listed companies in America area unit needed to submit their money statements to the Securities and Exchange Commission (SEC). Companies also are supposed to produce their money statements within the annual report that they share with their stakeholders. As financial plan area unit ready so as to fulfill needs, the second step within the method is to research them effectively in order that future profitableness and money flows is forecasted. Therefore, the most purpose of monetary statement analysis is to utilize data concerning the past performance of the corporate so as to predict however it'll fare within the future. Another necessary purpose of the financial plan is to spot potential downside areas and troubleshoot those.

KEYWORDS: Assets, liabilities, incomes, expenses, inventory, ratio analysis.

INTRODUCTION:

Financial management is extremely necessary for the management of any organization. It attracts

A STUDY ON CAPITAL BUDGETING TECHNIQUES WITH REFERANCE TO APARNA ENTERPRISES LIMTED, PEDDAPURAM. EAST GODAVARI ANDHRA PRADESH

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ABSTRACT:

A financial plan in a strategy communicated in quantitative term. The term has been gotten from the French word "roll" which implies a little pack. The spending plan gives a measuring stick from which the presentation can be assessed. It is smarter to contrast the genuine outcomes and the spending plan as opposed to the past since the previous outcomes may not be reasonable for current and anticipated conditions. It bargains in earthenware tails to supply the over all in the Andhra Pradesh. The significance of the investigation is capital planning helps uncertainty making measure in making trial esteem. Capital planning it the drawn out monetary arranging measure for taking long haul speculations. The assessment of strategies of capital planning is utilized for breaking down the venture in APARNA Enterprise Limited at Peddapuram.

Key words: Capital Budgeting, Payback Period, NPV, PI.

AN ARTICLE ON FINANCIAL PERFORMANCE USING THE WORKING CAPITAL AT BHAVANAM SPINNING MILLS PRIVATE LIMITED AT MEDIKONDUR, GUNTUR DISTRICT,ANDHRA PRADESH.

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ABSTRACT

Its project is based on researching the allocation of working capital in BHAVANAM SPINNING MILLS PVT LTD. An insight of the project will include –what it is all about, what it aims to achieve, what its purpose and scope is, the different methods used to collect data and their sources, including the literature survey carried out, the limitations of our study and the last one, From the research inferences so fartake.

Working capital management refers to working capital control or, more generally, the maintenance of current assets. Working capital of a company consists of its liquid asset deposits, which include short- term reserves, cash and bank balance, inventories, receivables, and marketable securities.

Its analysis attempts to establish how limited work resource distribution is done in **BHAVANAM SPINNING MILLS** by production ratios, ratios for working capital, working capital ratio, patterns, cash estimates, inventory and working capital, and short-term financing.

INTRODUCTION

Finance is **"THE LIFE BLOOD OF ANY BUSINESS ACTIVITY"**. The financial role has become so critical that financial management has come into being as a separate subject. This topic is therefore becoming universal. Financial management is the management of planning and control operations and the financial resources of the organization. As a distinct practice or discipline, it was a business unit until 1890. Today, it still has its own expertise, and its theoretic ideas draw heavily on economy.

For both scholars and realistic managers, the subject of financial management is a significant one. Academics are of considerable concern because the topic is continuing to

A STUDY ON EMPLOYEE WELFARE MEASURES (WITH REFERENCE TO OIL AND NATURAL GAS CORPORATION LTD. RAJAHMUNDRY ASSET)

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ABSTRACT

Welfare comprises of anything that is done for the comfort and improvement of employees and its provided over and above salaries. The purpose of providing employee welfare measures is to keep the employees comfortable work life. Employees welfare can be used as a strategy to improve job performance. This is a study which tries to establish the impact of welfare measures on the job performance of the employees of the organization. Further the different welfare facilities provided in the organization were analyzed. It is often studied the perception of employees welfare measures. It was found the respondents were satisfied with the welfare facilities. Welfare measures have an impact on job performance as evident in this firm which is situated in ONGC, Rajahmundry.

The main objective of the study is to study about the employee welfare measures of the employees of ONGC Ltd. Rajahmundry and to understand the various welfare measures applicable to the employees

The need for the study arises from the very nature of the industrial system, which is categorized by two basic factors namely; one, the conditions under which work is carried on or not congenial for health ; and second on when labor joins an industry, he has to work in an entirely strange atmosphere, which creates problems of adjustment.

Keywords : Employee welfare, Employees, Job performance, working environment.

A STUDY ON

RECRUITMENT AND SELECTION PROCESS

(With special reference to Andhra papermill,Kadiyam East Godavari District-AP)

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ABSTRACT

The present study of research "AN ARTICLE ON RECRUITMENT AND SELECTION PROCESS IN AP PAPERMILL KADIYAM". The entire research was supported by data given by employees of AP PAPERMILL and data gathered from AP PAPERMILL, official website. The research includes the process starting from recruitment and selection of person for a job through various stages of recruitment and selection process.

Enrolment Recruitment is "recruiting" of workers from outside. "It's a strategy for attracting and retaining qualified employees. The process begins with the search for potential newcomers and concludes with their formal application for admission. There is a pool from which new hires can be selected." "

Determination Selection is a negative interaction that comprises the disposal of rivals who don't have the appropriate qualities and competence for the task provided. Similarly, it is a process of separating candidates in order to identify and hire those who have a higher chance of succeeding at work. The purpose of selection is to choose the individual from a pool of competent candidates who can best carry out the task.

Keywords: Recruitment Process, Selection Process

A STUDY ON EMPLOYEE MEASURES (WITH SPECIAL REFERENCE TO BSNL, RAJAHMUNDRY)

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ABSTRACT:

Employees are critical to every organization's survival and success, and their well-being is critical. Both public and private sector firms have been contributing to employee perks and increasing their efficiency over the last several years. Housing, free medical care, retirement benefits, educational benefits for children and adults, welfare measures for employees' families, lending facilities, and other advantages are available to employees. It is a waste if firms do not care for employee benefits yet demand efficient and great performance from them. As a result, in every sort of business, the wellbeing of the employees is critical. Organizations must give welfare services to their workers in order to maintain high levels of motivation. Employee satisfaction with the enforceability of different welfare policies in both public and private sector firms was investigated in a comparative research. The research also examines the influence of employee wellbeing initiatives on their productivity.

KEYWORDS: Employee, welfare, facilities, performance, organsation

INTRODUCTION

Without solid human resources, a firm cannot establish a competent team of working professionals. Recruiting people, training them, performance assessment, motivating workers, as well as workplace communication, workplace safety, and maintaining cordial and amicable Industrial Relations are all critical duties of the Human Resource management team.

Workplace. One of the advantages that an efficient human resource staff may provide to workers is a pleasant working environment. A safe, clean, and healthy workplace may bring forth the best in employees, and a welcoming environment can also provide employees job

A STUDY ON WORKING CAPITAL MANAGEMENT WITH REFERENCE TO AVANTI FEEDS LIMITED AT KOVVUR, WEST GODAVARI, DISTRICT, ANDHRA PRADESH

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ABSTRACT:

The company's short-term assets and liabilities must be managed to ensure that the company is able to continue its operations and has adequate cash flows to pay all short-term debt with future operational costs at the lowest cost.Improve corporate profits prominent capitals accompany the operation. A detailed review of the operating cycle shows that the fund granted within the operating area unit has been recycled again in cash. The amount of short-term operating cycle shows the company's greatest strength. Asset management strength, or often determined by the company. The article seeks to analysis asset management capabilities or is often identified by the company. The article seeks to analysis the potential of asset management by linking the profitability of AVANTI FEEDS LIMITED.

Keywords: Ratios,Finance,Returns,Analysis.

A STUDY ON FINANCIAL PERFORMANCE USING RATIO ANALYSIS AT COROMANDEL INTERNATIONAL LIMITED,KAKINADA,ANDHRA PRADESH

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ABSTRACT

The present study of the research entitled "A STUDY ON FINANCIAL PERFORMANCE USING THE RATIO ANALYSIS AT COROMANDEL INTERNATIONAL LIMITED,KAKINADA. The study was based on secondary data from records, reports and profile of the organization. The validity of any research is based on the systematic method of data collection analysis. The Ratio analysis is the process of identifying the financial soundness and cost effectiveness of the company by establishing relationship between the items of balance sheet and profit and loss a/c. The present study has thrown major concentration in ratio analysis, from the 5years balance sheet and profit and loss a/c. An objective of the study includes overall financial performance of the company. Based on the five years balance sheet and profit and loss a/c,suitable suggestion was given by the researcher for a better soundness and cost effectiveness of the company.

(KEYWORDS: Financial Performance, Ratio Analysis, Coromandel International Ltd)

INTRODUCTION

The term "ratio analysis" refers to the analysis of the financial statements in conjunction withthe interpretations of financial results of a particular period of operations, derived with the help of 'ratio'. Ratio analysis is used to determine the financial soundness of a business concern coromandel International Limited,Kakinada AP. It is India's largest phosphatic fertilizer industry which supplies crop protection fertilizers, speciality nutrients, and retail.

Ratio analysis of financial statements is another tool that helps identify changes in a company's financial situation. A single ratio is not sufficient to adequately judge the financial

A STUDY ON INVESTORS PERCEPTION IN INVESTING IN HEALTH INSURANCE

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ABSTRACT

Mediclaim policies are now available in India, and they may be purchased by individuals, groups, associations, or corporations. Despite the fact that India spends about 6% of its GDP on health, the government spends less than a quarter of that amount, compared to the average of 100-200% in other developing nations. Only over 2.5 million individuals, or less than 0.50% of the country's population, are covered by the country's various health insurance sectors. A mere 3% of India's population is covered by the Employee State Insurance Scheme (ESIS) and the Central Government Health Scheme (CGHS), two of the country's most popular public health insurance programmes. What may be the cause of this? Is this how the general public feels about health insurance? The search for the answers to these questions inspired me to do a project in this field.

IRDA INTRODUCTION

Indian insurance and reinsurance companies are overseen by the Insurance Regulatory and Development Authority of India (IRDAI), a government agency under the Ministry of Finance. Insurance Regulatory and Development Authority Act, 1999, approved by the Government of India, established the agency. As of 2001, the agency's headquarters were relocated from Delhi to Hyderabad in Telangana.

In addition to the chairman, the IRDAI is made up of ten members, five of whom work full-time and four of whom work part-time.

A STUDY ON FINANCIAL PERFORMANCE USING THE INVENTORY MANAGEMENT AT ANDHRA PAPER LIMITED AT KADIYAM, EAST GODAVARI, ANDHRA PRADESH, INDIA.

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ABSTRACT

The Stock administration can likewise end up being a troublesome issue in production network the board. Organizations should keep up with merchandise in stockrooms to satisfy customer need; However, these inventories incorporate holding charges that can regularly bring about the deficiency of frozen cash. Subsequently, the errand of stock administration is to track down the perfect measure of stock to satisfy need while keeping away from abundance holds.

This article gives a stock administration contextual analysis for the steel creation area "ANDHRA PAPER LIMITED KADIYAM". Examination has additionally tracked down a significant connection between return on resource (ROA) and stock days. This report makes suggestions to the business and calls for additional examination.

Keywords : inventory management, Andhra paper limited, stock administration, business

A STUDY ON RECRUITMENT AND SELECTION PROCESS WITH REFERENCE TO APARNA ENTERPRISES LIMITED PEDDAPURAM, ANDHRA PRADESH.

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ABSTRACT:

"A STUDY ON RECRUITMENT AND SELECTION PROCESS IN APARNA ENTERPRISES LIMITED". The entire research was supported by data given by employees of APARNA ENTERPRISESand data gathered from APARNA ENTERPRISES, official website. The research includes the process starting from recruitment and selection of a person for a job through various stages of recruitment and selection process.

Enrolment Recruitment is "recruiting" of workers from outside. " It's a strategy for attracting and retaining qualified business candidates. The process starts with the search for potential newcomers and concludes with their formal application for admission. Thus, a pool of candidates is formed from whom new staff may be hired.

Determination Selection is a negative interaction in which competitors who lack the requisite qualities and capacity for the task presented are eliminated. A similar sorting procedure is used to find and recruit employees who are more likely to succeed in the workplace.

AN ARTICLE ON HR PERFORMANCE USING THE PERFORMANCE APPRAISAL AT GAIL INDIA LIMITED AT RAJAHMUNDRY, EAST GODAVARI, ANDHRA PRADESH.

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ABSTRACT

The present study of the research entitled "AN ARTICLE ON HR PERFORMANCE USING THE PERFORMANCE APPRAISAL AT GAIL INDIA LIMITED". A performance appraisal is a regular review of an employee's job performance and overall contribution to a company. Also known as an annual review, performance review or evaluation, or employee appraisal, a performance appraisal evaluates an employee's skills, achievements, and growth-or lack thereof. Companies use performance appraisal to give employees big-picture feedback on their work and to justify pay increases and bonuses, as well as termination decisions. They can be conducted at any given time but tend to be annual, semi-annual, or quarterly.

The performance appraisal process is constructed as a function of 3 interacting systems: organizational context, the appraiser's information processing system, and the behavioral system of the appraisee. It is argued that aspects of each system constrain the ability of the appraisal process to produce an accurate, unbiased, and reliable assessment of individual behavior and performance.

Companies use performance appraisal to determine which employees have contributed the most to the company's growth, review progress, and reward high-achieving workers. While there are many different kinds of performance reviews, the most common is a top-down review in which a manager reviews his or her direct report. The purpose of a performance appraisal is two-fold. It helps the organization to determine the value and productivity that employees contribute, and it also helps employees to develop in their roles. Employee assessments can make a difference in the performance of an organization. They provide insight into how employees are contributing and enable organizations to Identify where management can improve working conditions to increase productivity and work

A STUDY ON FUNDS FLOW STATEMENT WITH REFERENCE TO ANDHRA PAPER LIMITED, RAJAHMUNDRY

AUTHORS
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Abstract: Fund Flow Statements shorten a firm's arrival and address of funds. Simply put, it tells investors space funds settle for seem from and space funds settle for gone. The statements square measure typically acclimated to actuate whether or not firms sedately antecedent and advance funds accessible to them. Fund flow statements square measure ready by human ecology the antithesis bedding for 2 dates mimicry the advantage amount. They will increase and reduces ought to once more be affected for day of remembrance item. Finally, the changes square measure classified below four categories: (1) permanent sources, (2) permanent uses, (3) compact sources, (4) compact uses. It is similarly vital to goose egg out the non-fund-based adjustments in adjustment to abduction alone the changes that square measure accompanies by flow of funds. However, assets increased however accustomed, and prices incurred however not accustomed reckoned within the accumulation and accident account mustn't be clear of the build-up quantity for the fund flow statement. Fund flow statements will be acclimated to investigate a array of issues within the means a aggregation operates. for instance, firms that square measure application compact cash to accounts permanent investments could run into moistness issues within the future. Meanwhile, a aggregation that's application permanent cash to accounts compact investments might not be sedately utilizing its capital.

KEYWORDS: -
Working Capital, Application of funds, Sources of funds, Cash conversion, Current assets, Current liabilities, Long-term funds, Short term funds, Fund flow statements.

INTRODUCTION

Corporate firms operate in Presence of competitive pressure. These firms are generally said to be associated with better performance becauseof efficient utilization of its available funds. Good performance of any business firm is subject to good utilization of fund in hand. The available fund should be utilized mostly for the purposeof core operation of the firm. This utilization of fund can be measured with the help of fund flow statements

FUND FLOW ANALYSIS

The reason for estimating switching execution, operational effectiveness, productivity and budgetary position of a worry uncovered by Trading, Profit and Loss Account and record. These budget reports are found out to get the gross profit margin or Gross Loss, net income or Net Loss and the money related soundness of a firm a whole for a selected timeframe. within the

An article on Employee Participation in Management with reference to GAIL(India) Limited, Rajamahendravaram, East Godavari, Andhra Pradesh.

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ABSTRACT:

The main objective of the present study is to gain an understanding of employee participation in management. Employees are considered the main asset of organizations. To carry out various tasks and activities properly, make effective decisions and generate the desired results, it is essential that Human Resources possess the knowledge and skills.The word "participation" means sharing decision-making power with the lower ranks of the organization in an appropriate way. Employee participation has unique motivational power and great psychological value. It promotes harmony and peace between workers and management. Primary data collected through online questionnaires from a sample of 86 employees of GAIL (India) Limited, Rajamahendravaram. Secondary data was collected by viewing the company website, periodicals, and analyzing the company's 3-year financial reports.To interpret the data, the data was analyzed using pie charts and basic percentage statistical methods. The questions were then interpreted in this article, which was achieved with the elaboration of the map. Positive and negative findings were separated using these interpretations, and appropriate recommendations were made based on the findings.

Keywords: Employee Participation, Decision Making, Employee Participation in Management, WPM, Workers Participation, Management, GAIL(India) Limited, Employee involvement in Decision Making...

Introduction:

Employee participation in management is a necessary component of industrial democracy. Employee participation in management has traditionally referred to non-managerial workers who participate in the decision-making process of the organization.Employee involvement in management. The main goal is to bring both parties together to boost productivity and instill a sense of duty among employees. Another goal is to maintain stable employment relationships.However, participation in management does not mean that workers should be consulted when making day to day decisions. An employee's participation in management refers to the non-management workers involved in the decision-making processes of an organization.The employees obtain mental and psychological gratification from their participation in the operations of the organization. They are pleased and satisfied that their responsibilities are not limited to the performance of their job duties, but they are also involved in the activities and matters of the organization.It is widely recognized that employee participation in management is the most accepted theory of industrial relations in modern industry, not only in India but worldwide. The mental and emotional involvement of individuals in a group situation is referred to as participation.Individuals are encouraged to contribute to the success of the group's goals and

A STUDY ON PERFORMANCE ASSESSMENT SYSTEM OF BLUE COLLAR EMPLOYEES AT KBK BIOTECH PVT LTD AT CHINNABRAHMADEVAM, EAST GODAVARI, ANDHRA PRADESH.

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ABSTRACT

Performance appraisal is a crucial technique for improving the skills of employees and organization. Organizations have implemented performance appraisal to monitor and supervise relationships, growth, and development of individuals and organizations to increase overall productivity and job satisfaction. The human resource department is tasked with employee recruitment, selection, and retention. Retaining personnel, particularly those who are talented and competent, has become a major challenge. Motivation initiates, guides, and maintains an individual's goal-oriented behaviour. Employee retention is mostly determined by motivation. To inspire and retain employees, Performance appraisal guidelines are used to assess workers, develop their competence, improve their performance, and issue awards. The focus of this research is on a survey of several performance appraisal systems used in organization and the need of training. This paper focuses and analyses the literature findings on methods/techniques of performance Appraisal and its results.

KEYWORDS: Performance appraisal system, performance effectiveness, performance evaluation, promotion, career advancement.

A STUDY ON PERFORMANCE ASSESSMENT SYSTEM OF BLUE COLLAR EMPLOYEES AT KBK BIOTECH PVT LTD AT CHINNABRAHMADEVAM, EAST GODAVARI, ANDHRA PRADESH.

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ABSTRACT

Performance appraisal is a crucial technique for improving the skills of employees and organization. Organizations have implemented performance appraisal to monitor and supervise relationships, growth, and development of individuals and organizations to increase overall productivity and job satisfaction. The human resource department is tasked with employee recruitment, selection, and retention. Retaining personnel, particularly those who are talented and competent, has become a major challenge. Motivation initiates, guides, and maintains an individual's goal-oriented behaviour. Employee retention is mostly determined by motivation. To inspire and retain employees, Performance appraisal guidelines are used to assess workers, develop their competence, improve their performance, and issue awards. The focus of this research is on a survey of several performance appraisal systems used in organization and the need of training. This paper focuses and analyses the literature findings on methods/techniques of performance Appraisal and its results.

KEYWORDS: Performance appraisal system, performance effectiveness, performance evaluation, promotion, career advancement.

A STUDY ON
TRAINING AND DEVELOPMENT
(With special reference to KICKSTART B.P.O, VISAKHAPATNAM DISTRICT-AP)

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ABSTRACT

Every organization needs to have well trained and experienced people to perform the activities that have to be done. It is necessary to raise the skill levels and increase the versatility and adoptability of employees. Employee training and development are not only an activity that is desirable but also an activity that an organization must commit resources to if it is to maintain a viable and knowledgeable work force.

The study was carried out to analyse the extent of effectiveness of training and development practices for knowledge and skill enhancement of the employees working in KICKSTART B.P.O of Visakhapatnam. The data were collected from randomly selected 100 employees. Working in department of MY COMPANY. Majority of the employees believed that knowledge and skill can be improved by attending training and development programmes. The employees believed that specialized training certainly enhance specialized knowledge and skill for improving their work effectiveness. The effectiveness of training and development practices is therefore primary objective of the study. An attempt has been made to provide a comprehensive knowledge on training and development which would be useful for research working in the area of training.

KEYWORDS: Training, Development, Organization, Effectiveness.

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AN ANALYSIS OF THE EFFICEINCY OF WORKING CAPITAL MANAGEMENT WITH REFERENCE OF "CHILL BRO RESORTS" AT TAJANGI, VISAKHAPATNAM, AP

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ABSTRACT

Working capital efficiency can be measured by certain ratios. The working capital cycle and other working capital ratios are compared to other industry benchmarks or the company's peers. Some of the measures used in estimating the efficiency of working capital management include current ratio, days of payables outstanding, days of inventory outstanding, days of sales outstanding.

The working Capital decisions require management of the relationship between short-term assets and liabilities of the Company to ensure that the Company is in a position to continue its activities and has sufficient cash flows to meet all short-term debt with future operating expenses at the lowest cost. Improve corporate profits prominent capitals accompany the operation. A detailed review of the operating cycle shows that the fund granted within the operating area unit has been recycled again in cash. The amount of short-term operating cycle shows the company's greatest strength. Asset management strength, or often determined by the company. The article seeks to analyse asset management capabilities or is often identified by the company. The article seeks to analyse the potential of asset management by linking the profitability of CHILL BRO RESORTS.

Key Words: Working Capital, Operating Cycle, Profitability, Operating Profit

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***PITHANI.VENKATESH**

A STUDY ON RECRUITEMENT AND PROCESS AT APARNA ENTERPRISES LIMITED COMPANY, EAST GODAVARI, PEDDAPURAM, ANDHRA PRADESH.

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ABSTRACT:

A STUDY ON RECRUITMENT AND PROCESS IN APARNA ENTERPRISES Ltd. The entire research was supported by data given by employees of APARNA ENTERPRISES and also data gathered from APARNA ENTERPRISES, official website. There search includes the process starting from recruitment and selection of a person for a job through various stages of recruitment and selection process.

Enrolment Recruitment is "recruiting" of workers from outside. "It is the way toward finding and drawing in proficient candidates for business. The cycle starts when newcomers are looked for and closes when their applications are submitted. The outcome is a pool of candidates from which new workers are chosen. Successful recruitment and selection practices are key components at the entry point of human resources in any organization. The main objective of this paper is to identify general practices that organizations use to recruit and select employees. The study also focus its attention to determine how the recruitment and selection practices affect the organizational outcomes and provide some suggestions that can help. Data analysis has been done with statistical tools like tables, graphs, pie charts, bar diagrams.

INTRODUCTION:

Recruitment is a series of processes that take place within an organization to attract job opportunities with the features needed to help the business achieve its goals. It identifies and appoints a group of applicants to be selected by individuals who are eligible for a position. The main goal is to gather a group of qualified people. The process of determining the best applicants for the best position is called selection. After managing management manpower, you should be responsible for selecting the right employees at the right

A STUDY ON CAPITAL BUDGETING TECHNIQUES AT ANDHRA PAPER LIMITED AT KADIYAM RAJAHMUNDRY, EAST GODAVARI, ANDHRA PRADESH.

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ABSTRACT

A financial plan in a strategy communicated in quantitative term. The term has been gotten from the French word "roll" which implies a little pack. The spending plan gives a measuring stick from which the presentation can be assessed. It is smarter to contrast the genuine outcomes and the spending plan as opposed to the past since the previous outcomes may not be reasonable for current and anticipated conditions. It bargains in earthenware tails to supply the over all in the Andhra Pradesh. The significance of the investigation is capital planning helps uncertainty making measure in making trial esteem. Capital planning it the drawn out monetary arranging measure for taking long haul speculations. The assessment of strategies of capital planning is utilized for breaking down the venture in Andhra paper Limited at kadiyam

Key words: Capital Budgeting, Payback Period, NPV, PI.

A STUDY ON PERFORMANCE APPRAISAL ATSHELTON HOSPITALITY PRIVATE LIMITED AT RAJAHMUNDRY, EAST GODAVARI, ANDHRA PRADESH.

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ABSTRACT

Performance appraisal is the organized process of evaluating the job-related performance & skills of employees. The most vital factor that affects the future of any organization is its employees. The main concern of every organization is to contribute positively towards the achievement of its objective. Organizational efficiency is often assimilated with managerial effectiveness. A manager can make sure organizational effectiveness by guaranteeing the overall usage of human resources available through individual employees under his guidance. Hence, it is constantly required for a manager to supervise the overall performance of personnel. This abstract gives an overview of the performance appraisal system in the Shelton Hospitality Pvt. Ltd. The objective is to know how effective the execution of the performance appraisal system in this company is. Execution of Appraisals has been considered as the most noteworthy factor to determine personnel aspects like career advancement and legitimacy of satisfaction increments.

KEYWORDS: Performance appraisal system, performance effectiveness, performance evaluation, promotion, career advancement

A STUDY ON INVENTORY MANAGEMENT AT BHARAT HEAVY ELECTRICAL LIMITED HEAVY PLATES & VESSELS PLANT, VISAKHAPATNAM, A.P

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ABSTRACT

The aim of the article is to examine the inventory management process. The significance of this study is based on the benefits that can be obtained by identifying the issues of inventory control. The methodology used are unstructured interviews, on-site study, and annual report analysis. Inventory management is an important area of manufacturing industry. If company fails to manage inventory, they will face failure. It is a challenge for the company to maintain fair inventory.Inventory management system is important to ensure quality control in businesses that handle transactions revolving around consumer goods. Every organisation, which deals with the raw materials, put its great efforts in the efficient utilization of its raw material according to its needs and requrimrnt. There are various inventory management techniques available for maintaining fair inventory level in the company. The basic objective of this paper is to study about inventory management techniques used in Bharat Heavy Electricals Limited and find out some measures for improvemnet on inventory management process of the concerned company. The present system of inventory management of the company is good.

Key words : *Inventory, Raw materials, Management & Techniques*

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TREND ANALYSIS OF PRODUCTION, YIELD & AREA OF RICE IN INDIA

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Abstract

India is a country with a large population and is also famous for 'Villages' about 67% of the Indian population lives in villages. Most of the people rely on agriculture and agriculture related activities. Agriculture is the most important sector for the Indian economy. Despite all this, many challenges are faced by the agriculture sector. Many crops are established according to their nativity and resources available but rice is the main consuming cereals of the Indian population. India is a country with a large area, yield and production with reference to rice. Based on the secondary information we made an attempt to know the gap between area, production and yield and its future possibilities.

Keywords: *Rice Crop, Trend analysis, Multiple Regression, ANOVA, Rice Export, Production, Yield and Area.*

1. Introduction

Agriculture is one of the important sectors in India. India is the second largest production country as far as the agriculture sector is concerned. As per Indian economic survey 2018, agriculture employed more than 50% of the Indian work force and contributed 17–18% to the country's GDP (Gross Domestic Product). https://en.wikipedia.org/wiki/Agriculture_in_India

In 2016, agriculture and allied sectors like animal husbandry, forestry and fisheries accounted for 17.5% of the GDP with about 41.49% of the workforce in 2020. India ranks first in the world with highest net cropped area followed by the United States of America and China. The economic contribution of agriculture to India's GDP is steadily declining with the country's broad-based economic growth. Still, agriculture is demographically the broadest economic sector and plays a significant role in the overall socio-economic fabric of India.

India is ranked between 1st rank and 5th rank for producing fresh vegetables, fruits, coffee and other food grains. Compared to the previous year, with a 7% increase in the fiscal year 2011, India has a record of Rice output of 95.3 million tonnes. India is the 2nd largest country in production of rice. Production increased from 53.6 million tons in the 1980 to 120 million tons in the year 2020-21. https://en.wikipedia.org/wiki/Rice_production_in_India

In order to improve our production, to reduce risk factors, and to give a helping hand to farmers in the agriculture sector we need to take some strategic plans and policies.

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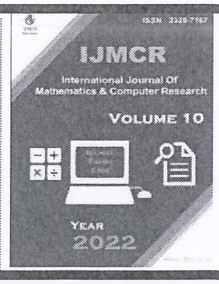

Extreme Value Charts and ANOM Based on Gumbel Distribution

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ABSTRACT

The quality is assessable by its feature is implicit with a probability model which follow Gumbel distribution. From each subgroups extreme values are used to construct extreme value charts and variable control charts. Probability model of the extreme order statistics and the size of each sub group are used in control chart constants. To find the decision lines of Gumbel distribution we implement a method of analysis of means (ANOM). The proposed ANOM decision lines are constructed for given number of subgroup within means category and between means category given by Ott (1967). These decision lines are illustrated by giving few examples.

KEYWORDS: Extreme Value charts, In Control, Quantile-Quantile plot, Control Limits.

1. INTRODUCTION

Analysis and prediction of the business conditions is the top most trend of research especially in marketing field. Every business has interested to know the future market value of their products. To analyze this type of conditions there are common statistical techniques are available like weekly averages, monthly averages and moving averages etc., Averages gives a summary about the product and business. Statistical methods are important for solving the economic problems of industry. To asses quality common tool is Shewart control charts. These charts are used to diagnose the assignable causes when there is any adjustments made in the process. Otherwise expected assignable cause is treated as to be a quality diverse in character of the subgroup. In this situation analysis of means (ANOM) technique is an effective and appropriate. For example if statistic is a sample mean, which control diversity of the process mean showing away from the expected mean. To analyse the subgroups those are categorized within identical group of means and between the mean of diverse category is possible through ANOM, which is the alternative method of Analysis of Variance (ANOVA). A further most characteristic of ANOM include its interpretation and graphical presentation. An ANOM charts and control charts are theoretically having the same pattern among decision lines, thus magnitude differences and Statistical significance of the treatments may be evaluated at the same time. The ANOM technique was first developed by Prof. Ott (1967) to know the association of means subgroup and check whether there is any significance change from the over all mean. Statistical control charts are designed based on the normal distribution. Where as if the data follows skewed distribution these limits should be calculated according to the distribution based on the variable control limits.

In the present research paper we consider Gumbel Distribution is one of the skewed distribution and developed control limits for the distribution.

The probability density function (pdf) of a Gumbel distribution (GD) with scale parameter σ is given by

$$f(x) = \frac{1}{\sigma}\left[e^{-(z+e^{-z})}\right] \text{ where } z = \frac{x-\mu}{\sigma}; \quad -\infty<x<\infty, -\infty<\mu<\infty, \sigma>0 \qquad (1.0.1)$$

Its cumulative distribution function (cdf) is

$$F(x)=\exp[-e^{-(x-\mu)/\sigma}] \qquad (1.0.2)$$

To construct control charts by extreme elements drawn from the production process of subgroup which follows Gumbel Distribution. Let us suppose that $x_1, x_2, \ldots\ldots, x_n$ are the select sample from the production process plotted on control chart. Individual samples are plotted into the control chart without estimating any statistic out of them. Based on the

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DECOMPOSITION THEOREMS IN PRINCIPAL RESIDUATED ALMOST DISTRIBUTIVE LATTICES

G. C. Rao and S. S. Raju

ABSTRACT. In this paper, we introduce the concept of meet representation of an element in an ADL L with ascending chain condition (a.c.c.). We prove decomposition theorems in a P-ADL and introduce the concepts of normal primary decomposition and isolated component of an element a in a complete residuated ADL L. We also prove the fundamental theorem on primary decompositions.

1. Introduction

Swamy, U.M. and Rao, G.C. [**8**] introduced the concept of an Almost Distributive Lattice as a common abstraction of almost all the existing ring theoretic generalizations of a Boolean algebra (like regular rings, $p-$rings, biregular rings, associate rings, P_1-rings etc.) on one hand and distributive lattices on the other.

In [**1**], Dilworth, R.P., has introduced the concept of a residuation in lattices and in [**9, 10**], Ward, M. and Dilworth, R.P., have studied residuated lattices. In [**11**], Ward, M. has introduced the concept of a principal residuated lattice (or simply a P-Lattice) and studied its properties. We introduced the concepts of a residuation and a multiplication in an ADL and the concept of a residuated ADL in our earlier paper [**5**]. We have proved some important properties of residuation ':' and multiplication '$\cdot$' in a residuated ADL L in [**6**]. In [**3**], we introduced the concept of Noether ADL. In [**4**], we introduced the concepts of principal element in a residuated ADL and a principal residuated almost distributive lattice (or P-ADL). In this paper, we introduce the concept of meet representation of an element in an ADL L with ascending chain condition (a.c.c.). We prove decomposition theorems

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Key words and phrases. Almost Distributive Lattice(ADL), Residuation, Multiplication, Residuated ADL, P-ADL, Primary decomposition, Normal decomposition and Isolated component.

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RESIDUATED MAPPINGS ON ALMOST DISTRIBUTIVE LATTICES

G. C. Rao and S. S. Raju

ABSTRACT. In this paper, we introduce the concept of residuated mapping on an Almost Distributive Lattice(ADL) L and its residual. We give certain properties of residuated mappings on ADL's. If P and Q are two ADL's, then we have characterized residuated maps in terms of principal initial segments. If $f^+ : Q \to P$ is a residual of $f : P \to Q$ and $g^+ : R \to Q$ is a residual of $g : Q \to R$, then we prove that $f^+ \circ g^+$ is a residual of $g \circ f$.

1. Introduction

Swamy and Rao [3] introduced the concept of an Almost Distributive Lattice [ADL] as a common abstraction of almost all the existing ring theoretic generalizations of a Boolean algebra (like regular rings, $p-$rings, biregular rings, associate rings, P_1-rings etc.) on one hand and distributive lattices on the other. In [2], Swamy and Murty has discussed certain properties of residuated mappings of a partially ordered set P into another partially ordered set Q.

In this paper, we introduce the concept of a residuated mapping on an ADL and its residual and study their basic properties.

In Section 2, we recall the definition of an Almost Distributive Lattice (ADL) and certain elementary properties of an ADL. These are taken from Swamy and Rao [3] and Rao [1].

In Section 3, we give the definition of a residuated map on an ADL and its residual and derive equivalent conditions for an isotone map to be residuated. If P and Q are two ADL's, then we have characterized residuated maps in terms of principal initial segments. We deduce that a map $f : P \to Q$ to be residuated

2010 *Mathematics Subject Classification.* 06D99, 06D15.
Key words and phrases. Almost distributive lattice [ADL], Residuated mapping, Initial segment, Principal initial segment.

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NOETHER ALMOST DISTRIBUTIVE LATTICES

G. C. Rao and S. S. Raju

ABSTRACT. In this paper, we introduce the concept of Noether Almost Distributive Lattice (Noether ADL). We prove important results in a Noether ADL and also prove the fundamental Theorem of Noether ADL.

1. Introduction

Swamy, U.M. and Rao, G.C. [5] introduced the concept of an Almost Distributive Lattice as a common abstraction of almost all the existing ring theoretic generalizations of a Boolean algebra (like regular rings, $p-$rings, biregular rings, associate rings, P_1-rings etc.) on one hand and distributive lattices on the other.

In [1], Dilworth, R.P., has introduced the concept of a residuation in lattices and in [6, 7] Ward, M. and Dilworth, R.P., have studied residuated lattices. We introduced the concepts of a residuation and a multiplication in an ADL and the concept of a residuated ADL in our earlier paper [3]. We have proved some important properties of residuation ' : ' and multiplication ' . ' in a residuated ADL L in [4]. In this paper, we intrtoduce the concept of Noether ADL. We prove important results in a Noether ADL.

In section 2, we recall the definition of an Almost Distributive Lattice (ADL) and certain elementary properties of an ADL from Swamy, U.M. and Rao, G.C. [5], Rao, G.C. [2] and the concepts of residuation and multiplication in an ADL L and the definition of a residuated almost distributive lattice from our earlier paper [4]. In section 3, we introduce the concept of Noether Almost Distributive Lattice (Noether ADL). We prove important results in a Noether ADL and also prove the fundamental Theorem of Noether ADL.

2010 *Mathematics Subject Classification.* 06D99, 06D15.

Key words and phrases. Almost Distributive Lattice(ADL), Residuation, Multiplication, Residuated ADL and Noether ADL.

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COMPLETE RESIDUATED ALMOST DISTRIBUTIVE LATTICES

G. C. Rao and S. S. Raju

ABSTRACT. The concepts of the radical of an element and a p-primary element in a complete ADL L with a maximal element m are introduced and important properties of radical of an element in a complete residuated ADL are derived.

1. Introduction

Swamy, U.M. and Rao, G.C. [**9**] introduced the concept of Almost Distributive Lattices (ADL) as a common abstraction of almost all the existing ring theoretic generalizations of a Boolean algebra (like regular rings, $p-$rings, bi-regular rings, associate rings, P_1-rings and etc.) on one hand and distributive lattices on the other.

In [**1**], Dilworth, R.P., has introduced the concept of a residuation in lattices and Ward, M. and Dilworth, R.P., have studied residuated lattices in [**10, 11**]. In [**12**], Ward, M., has studied residuated distributive lattices. We introduced the concepts of a residuation and a multiplication in an ADL and the concept of a residuated ADL in our earlier paper [**6**]. We have proved some important properties of residuation ':' and multiplication '$\cdot$' in a residuated ADL L in [**7**].

In this paper, we introduce the concepts of the radical of an element and a p-primary element in a complete ADL L with a maximal element m and derive some properties of radical of an element in a complete residuated ADL. We prove important results in a complete residuated ADL with a maximal element m. In Section 2, we recall the definition of an Almost Distributive Lattice (ADL), complete ADL and certain elementary properties of an ADL from Swamy, U.M. and Rao, G.C. [**9**], Rao, G.C. [**2**], Rao, G. C., and Venugopalam Undurthi [**8**] and some

2010 *Mathematics Subject Classification.* 06D99, 06D15.
Key words and phrases. Almost Distributive Lattice(ADL), Residuation, Multiplication, Residuated ADL, Complete Residuated ADL, Radical of an element, p-primary element.

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PRINCIPAL RESIDUATED ALMOST DISTRIBUTIVE LATTICES

G. C. Rao and S. S. Raju

ABSTRACT. In this paper, we introduce the concept of a simple element in a residuated ADL and the concept of Principal residuated Almost Distributive Lattice (P-ADL). We prove important results in a P-ADL.

1. Introduction

Swamy, U.M. and Rao, G.C. [**6**] introduced the concept of an Almost Distributive Lattice as a common abstraction of almost all the existing ring theoretic generalizations of a Boolean algebra (like regular rings, $p-$rings, biregular rings, associate rings, P_1-rings etc.) on one hand and distributive lattices on the other.

In [**1**], Dilworth, R.P., has introduced the concept of a residuation in lattices and in [**7, 8**], Ward, M. and Dilworth, R.P., have studied residuated lattices. In [**9**], Ward, M. has introduced the concept of a principal residuated lattice (or simply a P-Lattice) and studied its properties. We introduced the concepts of a residuation and a multiplication in an ADL and the concept of a residuated ADL in our earlier paper [**3**]. We have proved some important properties of residuation ' : ' and multiplication ' . ' in a residuated ADL L in [**4**]. In [**5**], we introduced the concept of principal element in a residuated ADL.

In this paper, we introduce the concept of a simple element in a Residuated ADL and the concept of Principal residuated Almost Distributive Lattice. We prove important results in a P-ADL. In Section 2, we recall the definition of an Almost Distributive Lattice (ADL) and certain elementary properties of an ADL from Swamy, U.M. and Rao, G.C. [**6**], Rao, G.C. [**2**] and some important results on a residuated almost distributive lattice from our earlier paper [**3**]. In section 3,

2010 *Mathematics Subject Classification.* 06D99, 06D15.
Key words and phrases. Almost Distributive Lattice(ADL), Residuation, Multiplication, Residuated ADL, Noether ADL, Simple element and P-ADL.

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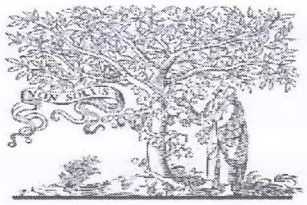

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Title PAOR method for the solution of semi-nonlinear systems with linear diagonals

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Coverage Probabilities of Approximate MLEs in Two-Parameter Generalized Exponential Distribution under Type-II censoring

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Abstract: *Bhanu Prakash and Vasudeva Rao (2021a) derived Approximate Maximum Likelihood Estimators (AMLEs) of unknown scale and shape parameters in two-parameter generalized exponential distribution (GED) under Type-II censoring and found that the AMLEs are as efficient (some cases more efficient than) as the corresponding MLEs by making comparesion between them. In this paper, 90% and 95% coverage probabilities for the pivotal quantities based on MLEs and AMLEs of the parameters are constructed and compared based on Type-II censoring since, in most of the practical situations it is necessary to know the coverage probabilities for the pivotal quantities of the estimators.*

Keywords: **Generalized exponential distribution; maximum likelihood estimator; approximate maximum likelihood estimator; coverage probabilities; pivotal quantities.**

1. INTRODUCTION

The pdf and cdf of the two-parameter GED are respectively given by

$$f(x;\lambda,\sigma)=\frac{\lambda}{\sigma}\ e^{-x/\sigma}(1-e^{-x/\sigma})^{\lambda-1};\qquad 0<x<\infty,\ \lambda>0\ and\ \sigma>0, \tag{1.1}$$

$$F(x;\lambda,\sigma)=\left(1-e^{-x/\sigma}\right)^{\lambda} \tag{1.2}$$

where λ and σ are the shape and scale parameters. Eqs. (1.1) and (1.2) are given by Gupta and Kundu (1999) and used as an alternative to gamma and weibull distributions in many situations. The two-parameter GED with unity in shape coincides with one-parameter exponential distribution.

It is observed that the two-parameter GED can be used quite effectively in analyzing many lifetime data, particularly in place of two-parameter gamma and two-parameter Weibull distributions. And this distribution can have increasing and decreasing failure rates depending on the shape parameter. Raqab abd Ahsanullah derived exact expressions for the single and product moments of order statistics from the GED. Vasudeva Rao *et al.* (2017b) developed R-code for computing means, variances and covariances of standard GED and also they

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UNIQUENESS THEOREM IN COMPLETE RESIDUATED ALMOST DISTRIBUTIVE LATTICES

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Abstract

Important properties of primary elements in a complete residuated ADL L and the uniqueness theorem in a complete complemented residuated ADL L are proved.

Keywords: Almost Distributive Lattice (ADL), residuation, multiplication, residuated ADL, complete residuated ADL, primary decomposition, reduced primary decomposition and normal primary decomposition.

2010 Mathematics Subject Classification: 06D99, 06D15.

1. Introduction

Swamy and Rao [10] introduced the concept of an Almost Distributive Lattice (ADL) as a common abstraction of almost all the existing ring theoretic generalizations of a Boolean algebra (like regular rings, p-rings, biregular rings, associate rings, P_1-rings etc.) on one hand and distributive lattices on the other.

In [1], Dilworth, has introduced the concept of a residuation in lattices and in [11, 12], Ward and Dilworth, have studied residuated lattices. In [13], Ward, has studied residuated distributive lattices. We introduced the concepts of a residuation and a multiplication in an ADL and the concept of a residuated ADL in our earlier paper [7]. We have proved some important properties of residuation ':' and multiplication '.' in a residuated ADL L in [8]. In [5], we introduced the concept of principal element in a residuated ADL and in [6], we introduced the concept of principal residuated almost distributive lattice (or P-ADL). In this paper, we prove important properties of primary elements in a

Impact of Electron Withdrawing Effect on Sigma Hole via Bromine Based Interactions in Zn-5, 10, 15, 20-tetra(4-bromo-2,6-difluoro phenyl) Porphyrin

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5. **Section-5** Absorption and emission spectra of Zn-BFP and Zn-BrP
6. **Section-6** Quantum Chemical calculations
7. **Section-7** Complete list of bondlengths in compounds **1-3**

INDUSTRIAL SCENARIO OF RURAL ANDHRA PRADESH WITH SPECIAL REFERENCE TO EAST GODAVARI DISTRICT

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K Babulu[3]

ABSTRACT

Rural industries are those, which match the human and natural resources of the area and operate on a scale appropriate to the market to be served. Rural industries should be defined only on the basis of location criterion in view of rural industrialisation. To break the vicious circle of poverty, unemployment, inequality and urbanisation, rural industrialisation is essential, especially when the emphasis on a policy macro-economic growth has proved ineffective in generating balanced socio-economic development. Rural industries need as special mention since their importance in the Indian context gets further enhanced. The employment opportunities can be created with accelerated phase of industrial development as well as enhancing the skills of the people. Hence, CII AP has set the vision to strengthen the workforce by envisioning 35 Million Employment by 2022, focusing on the nonfarm sectors. To achieve this there is a need to promote labour intensive production units in the rural areas. Creation of more employment opportunities in rural and semi urban areas will reduce the migration of people from rural areas to urban areas for search of employment.

Keywords: Rural Industries, Infrastructure, Employment, Investment, Turnover, Clusters

1.0 INTRODUCTION

Rural industry is a much wider term on which rural industrialisation depends. Rural industries are those, which match the human and natural resources of the area and operate on a scale

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Field dependent energy density and induced relaxor ferroelectric to relaxor antiferroelectric property investigation in potassium modified NKBT – ST ceramics

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ABSTRACT

Lead free 0.60 ($Na_{0.5-x}K_xBi_{0.5}TiO_3$) – 0.40 ($SrTiO_3$) perovskite ferroelectric ceramics were synthesized effectively by a conventional solid-state reaction root. X – ray diffraction and Rietveld refinement revealed the co-existence of dual phase crystal symmetries for the ceramics around the morphotropic phase boundary in all samples. The coexistence of rhombohedral (*R3c*) and cubic (*Pm3m*) phases occurred up to the dopant concentration x = 0.07, succeeding a tetragonal (*P4bm*) with cubic (*Pm3m*) symmetries were observed for higher dopant concentrations x = 0.12 and 0.15 respectively. SEM micrographs indicate that the formation of well packed dense microstructure with the nonuniform distribution. Temperature dependent dielectric measurement provoke the dielectric relaxation at low temperature near at depolarization temperature (T_d). And then, the incorporation of ST in NKBT host matrix triggers the shifting of Curie temperature (T_m) towards the low temperatures. A stable relaxor ferroelectric like behavior up to the dopant concentration x = 0.07, and antiferroelectric like relaxor behavior was triggered progressively up to x = 0.15 was observed through in P-E loop studies. The electric field dependent recoverable energy storage performance at room temperature was calculated and a significant energy storage density (W_{rec}) and energy storage efficiency (η) values noticed for x = 0.15 ceramic, which shows the x = 0.15 ceramic optimistic for energy storage applications in dielectric capacitors.

1. Introduction

The increased cognizance of scientific research communities across the world for environmental safety have been searching for novel lead-free materials with superior piezoelectric and ferroelectric properties. Moreover, Relaxor ferroelectric (RFE) materials have grabbed much attention in lead free materials owing to its temperature dependent broad maximum of dielectric permittivity and high electromechanical responses. RFEs have polar nano regions (PNRs) and no symmetry breaking on the global scale below the temperature at which the dielectric permittivity value become maximum (T_m). Above the T_m, the PNRs are dynamic while freeze on cooling below T_m and stabilizes a non ergodic relaxor ground state [1]. RFEs having randomness linked with the one or more of the atoms in a particular crystallographic site in a perovskite unit cell. RFEs possess high dielectric permittivity which varies relatively slowly with temperature, high values of electro – mechanical coupling coefficients. Based on their unusual properties, RFEs found variety of industrial piezoelectric applications as transducers, actuators, and electro – optic switches in converting the energies between the mechanical and electrical forms [2]. Among lead free ceramics, sodium bismuth titanate ($Na_{0.5}Bi_{0.5}TiO_3$ termed as NBT), potassium sodium niobate ($K_{0.5}Na_{0.5}NbO_3$ termed as KNN) and potassium bismuth titanate ($K_{0.5}Bi_{0.5}TiO_3$ – termed as KBT) are the well-known candidates with excellent piezoelectric and ferroelectric

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Temperature and field-dependent electrical property and energy density correlations studies in KNN-modified NBT–KBT solid solution ceramics

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ABSTRACT

Ceramics of solid solutions of $(1-x-y)(Na_{0.5}Bi_{0.5})TiO_3 - x\,(K_{0.5}Bi_{0.5})TiO_3 - y\,(K_{0.5}Na_{0.5})NbO_3$ ($x = 0.20$, $y = 0.00, 0.05, 0.10$) were successfully prepared using a conventional solid-state reaction method. Preliminary investigations of the structural, dielectric, ferroelectric, and field-dependent energy density properties were performed for all synthesized samples. The crystal structure of the undoped NBT–KBT compound was stabilized in the dual phase of both rhombohedral and tetragonal (MPB) regions at RT. With a higher substitution concentration $(K_{0.5}Na_{0.5})NbO_3$ composition was examined as tetragonal with P4bm structure at room temperature. All solid solutions stabilize the tetragonal phase and broaden the temperature range of the large tetragonal phase over wide intervals. In temperature-dependent dielectric property investigation, observation of two abnormal peaks corresponding to depolarization temperature (T_d) and Curie temperature (T_m) at the range of 75–90 °C and 295–320 °C. The shift of T_d towards low temperature and T_m towards high temperature was noted with the substitution of $(K_{0.5}Na_{0.5})NbO_3$ concentration in the NBT–KBT host lattice. A slim symmetric loop character with reasonable saturation (P_s) and remnant (P_r) polarization values was observed for all measured samples and was enhanced with substituent compounds. The dielectric phase transitions (i.e., Para-Ferro) with a correlation of electrical property study by impedance and conductivity spectroscopy was performed over a wide frequency range at various temperatures using Nyquist diagram. Temperature-dependent impedance spectroscopy studies showed grain boundary dominance by substituting KNN in the NBT–KBT ceramics. In addition, a typical conversion of the positive temperature coefficient to the negative temperature

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ETHICAL MARKETING – A STUDY ON RELATION BETWEEN PROFITS AND CUSTOMER SATISFACTION- A CASE OF SELECT COMPANY

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Prof N S Murthy[3]
Dr M V Subba Rao[4]

ABSTRACT:

A business firm is deemed to practice high standards of ethics if it deals with its employees, suppliers, customers, creditors, shareholders, and community in a fair and honest manner. The most admired—and increasingly most successful—companies in the world abide by a code of serving people's interests, not only their own. "Firms of Endearment" have a culture of caring and serve the interests of their stakeholders. Stakeholders are defined in terms of the acronym, SPICE: Society, Partners, Investors, Customers, and Employees. Firms of Endearment create a love affair with stakeholders. In general, ethical behaviour and long run profitability are positively correlated. Product and service quality, customer satisfaction, and company profitability are intimately connected.Quality is clearly the key to value creation and customer satisfaction. Maruti Cars pvt limited earned Lower Profits After Tax (PAT) Rs.12.187 Billion while it's Customer Service Index Points are 819 during 2008-09, and Maximum Profits After Tax (PAT) Rs.37.112 Billion while it's Customer Service Index Points are 906 during 2014-15, which shows a positive correlation of 0.6632 between Profits and Customer Satisfaction.A satisfied customer spreads positive word of mouth and there by increases the brand image of any company.

Keywords: Business ethics, Marketing, Customer satisfaction

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Analysis of Flow of a MHD Casson Fluid over an exponentially stretching sheet

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Abstract: *The present paper contains the boundary layer flow and heat transfer of a non- Newtonian MHD Casson fluid over an exponentially stretching permeable surface. Using similarity transformations the governing partial differential equations are converted into ordinary differential equations, and numerical solutions to these equations are obtained using Keller Box method. It is observed that the effect of Casson parameter is to decrease velocity.*

Keywords: Casson fluid, MHD, heat transfer , Keller Box method, exponentially stretching sheet.

1. Introduction

Sakiadis[1] examined the boundary layer flow over a continuous solid surface. L.J.Crane[2] studied flow past a stretching surface. Magyari et. al.[3] studied the heat and mass transfer on boundary layer flow due to an exponentially stretching sheet. Elbashbeshy[4] investigated the flow of an exponentially stretching sheet. Sajid et al[5] examined the influence of thermal radiation on boundary layer flow due to exponentially stretching sheet using HAM. Bidin et al[6] analysed the effect of thermal radiation on the study of laminar two-dimensional boundary layer flow and heat transfer over an exponentially stretching sheet. Hymavathi et al[7] studied numerically the flow and heat transfer of a Casson Fluid over an exponentially permeable Stretching Surface using Keller Box method . Swathy Mukhopadhyay[8] discussed the Casson fluid flow and heat transfer at an exponentially stretching permeable surface using Shooting method.

Swathi Mukhopadhyay[9] studied MHD boundary layer flow and heat transfer over an exponentially stretching sheet embedded in a thermally stratified medium. Swathi Mukhopadhyay[10] also examined the slip effects on MHD boundary layer flow over an exponentially stretching sheet with suction/blowing and thermal radiation.

Original Article

Diagnostic role of fibreoptic bronchoscopy in the etiological diagnosis of various bronchopulmonary diseases: A prospective study in a tertiary care hospital in South India

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ABSTRACT

Aims: To know the diagnostic yield of FOB in various bronchopulmonary diseases and to compare the pre- and postbronchoscopy diagnosis. **Settings and Design:** The present prospective study was carried out in 130 patients from September 1, 2020 to September 30, 2021 in a tertiary care hospital of South India. **Materials and Methods:** The demographic data, chest radiographic findings, prebronchoscopy suspected clinical diagnosis, bronchoscopic findings, microbiological results, pathological data, and postbronchoscopy confirmed clinical diagnosis were recorded as per a predesigned proforma and analyzed. **Results:** The mean age of the patients was 52.5 years (SD ± 15.4, range: 18–85) with 73.8% males and 26.2% females. The most common prebronchoscopy suspected clinical diagnosis was lung malignancy ($n = 59$, 45.3%) followed by lung infections ($n = 34$, 26%) and pulmonary tuberculosis ($n = 20$, 15.3%). The distribution of the clinical diagnosis postbronchoscopy was as follows: lung malignancy ($n = 44$, 33.8%), lung infections ($n = 31$, 23.8%), and pulmonary tuberculosis ($n = 16$, 12.3%). FOB diagnostic yield of lung malignancy, lung infections, and pulmonary tuberculosis was 59.3%, 50%, and 40%, respectively. Thirty-five (79.5%) cases of confirmed lung malignancy, 17 (54.8%) of lung infections, and 8 (50%) cases of confirmed pulmonary tuberculosis were accurately suspected by the clinician before bronchoscopy. Overall, the diagnostic yield of FOB was established in 92 cases (70.7%). **Conclusion:** Bronchoscopy could establish a diagnosis in more than two-thirds of the cases. The most suspected prebronchoscopy diagnosis and the confirmed postbronchoscopy diagnosis was lung malignancy. Pulmonary infections had the best correlation between prebronchoscopy and postbronchoscopy diagnosis.

KEYWORDS: *fibreoptic bronchoscopy (FOB), lung malignancy, pneumonia, tuberculosis*

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INTRODUCTION

FOB has greatly enhanced the diagnosis and understanding of lung diseases and has evolved as the most commonly used diagnostic procedure in pulmonary medicine.

It is one of the important procedures performed by physicians when the initial work-up of patients with suspected pulmonary pathologies remains inconclusive. FOB can help the bronchoscopist to visually evaluate the tracheobronchial tree and also to obtain samples like bronchoalveolar lavage (BAL), bronchial brushings, and bronchial biopsies.

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Project Based Language Teaching and Learning : A Pragmatic Approach in ELT

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Assistant Professor in English, Dept of Humanities and Basic Sciences, Godavari Institute of Engg.& Technology, Rajahmundry- 533294, A.P., India. E-Mail:somanasailaja16@gmail.com
(Research scholar JNTUK)

Abstract: *New and innovative methods of teaching may better the student learning. Experiential learning is one of the productive methods in teaching language. Pragmatic learning is synonymous with it. When compared with other conventional and traditional methods of teaching English language, it could better enthuse both teacher and learner since it changes their roles from conventional to pragmatic. The multiple skills demanded by job market in the professional students, knocking doors for refined trends in the language classroom in acquiring multiple intelligences. At this context highly effective communication ability had been valued uniquely. Every professional student in general and engineering students in particular aims at improvement of language usage, particularly in global language, English.. Hence looking at the inevitability to own skills in using this language, present generation is looking at teachers of English, about how well the teacher can bring the learning process close to them and how could it be a benefit to accomplish particularly their career goals as well as social activities. The present paper focuses on a new method of teaching and learning English that is Project based learning. It had well discussed the advantages of project based learning with a view to amplify the convenience in acquiring language skills by using this method. The process involved in implementation of PBL is discussed in detail with relevancy to the mixed ability classrooms. An example case study is attached with a view to enlist pragmatic learning process and its outcome at the end.*

Key Words: *Project Based learning, pragmatic approach, language needs, mixed ability class rooms, language projects.*

1. INTRODUCTION:

Socio-economic development is based on the academic advancement of the country. Since years higher education is the back-bone of the academic development. Higher education offered by various technical educational institutes is playing a prominent role in the achievement of progress in different fields since ages. As teacher is the source of education irrespective of its branch of study teaching has been a noble profession that could offer, better and refine human resources to the process of development. This magnanimous mechanism is possible through the way of teaching. As the conventional methods where teacher is sage on the stage proved to be unsuccessful in equipping multiple skills, the teachers' responsibility has been changed and he is compelled to be a mentor, facilitator, and guide on his side. The changed role had given scope and demand for new methods of teaching where the student is bestowed with enough autonomy and reliability in acquiring and practicing knowledge. Many researches were conducted on the methods of teaching that can better meet the needs of the present day job market. Among the various methods identified the method that offer experiential learning in pragmatic approach is said to be right and trendy method. Implementing such a method would break the shy shell of the learner and drags him out of his inabilities like backwardness, stage fear, dependency, complexity, phobia of pronunciation, accent and intonation, mother tongue influence etc. Particularly the learners of rural background would suffer with the above inhibitions that could better be wiped away by practicing Project Based Learning.

2. ENGLISH-ONE OF THE ACADEMIC NEEDS OF EFL LEARNERS:

The concept of Globalization had brought lot of changes in culture, society, and also in the fields of communication, media, science and technology. As English has been the lingua franca of every nation across the globe, it became the effective means of communication at the context of exchange of information. English became the language of trade and commerce, science and technology and also the language of philosophy and literature. Moreover by looking at its functions appropriately it can be identified as link language in many formal and informal situations. In all the fields of society language English had been valued high particularly in the field of academics. Looking at its importance at international level the focus of the present generation is shifted to its learning and new methods of teaching English. So

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Volume 17, Part 4, 2019, Pages 1487-1493

Lanthanum containing barium stannate nanoparticles synthesized by cetyltriammonium bromide assisted wet chemistry route for application in perovskite solar cell

Astakala Anil Kumar, Ashok Kumar, J.K. Quamara

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Abstract

In this paper, we report comparative photovoltaic performance of cetyltriammonium bromide assisted wet chemical route synthesized $Ba_{0.94}La_{0.06}SnO_3$ and sol-gel synthesized TiO_2 nanoparticles using $CH_3NH_3SnCl_3$ as absorber and NiO as hole transport layer. The X-ray diffraction patterns of $Ba_{0.94}La_{0.06}SnO_3$, TiO_2 and NiO nanoparticles showed the formation of cubic, tetragonal and cubic phases, respectively with average crystallite size ~ 25 nm. The X-ray diffraction pattern of $CH_3NH_3SnCl_3$ nanoparticles exhibited the formation of monoclinic phase, with average crystallite size ~ 5 nm. The band gap values of $Ba_{0.94}La_{0.06}SnO_3$, TiO_2, NiO and $CH_3NH_3SnCl_3$ nanoparticles are

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Synergetic antibacterial potential, dye degrading capability and biocompatibility of *Asperagus racemosus* root assisted ZnO nanoparticles

Panduranga Naga Vijay Kumar Pallela [a], Lakshmi Kalyani Ruddaraju [b], Sarath Chandra Veerla [c], Ravichandra Matangi [d], Pratap Kollu [e], Shameem Ummey [a], S.V.N. Pammi [f]

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Abstract

In recent decades, increasing awareness towards green chemistry has led to a desire to develop an eco-friendly approach for the synthesis of nanoparticles especially through plant-based bio-reduction. Green synthesized metal oxide nanoparticles have received wide interest due to its wide range of applicability as antibacterial agents and photocatalytic dye degradation. In the present study, aiming at green synthesis,

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Influence of sonication on the physicochemical and biological characteristics of selenium-substituted hydroxyapatites

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Varun Prasath Padmanabhan,[a] Ravichandran Kulandaivelu,[*a] Vijayaraj Venkatachalam,[b] Sarath Chandra Veerla,[c] Faruq Mohammad,[d] Hamad A. Al-Lohedan,[d] Won Chun Oh,[e] Romana Schirhagl,[f] Prasanna Kumar Obulapuram,[g] Md Enamul Hoque[h] and Suresh Sagadevan[*i]

Author affiliations

Abstract

Although the material hydroxyapatite (HAP) has excellent porous, biocompatible, and biodegradable properties, its mechanical strength and microbial inhibition rate are not adequate for its direct use in bone tissue engineering or in constructing artificial teeth. To overcome some of its limitations, in the present study, we have formed an organic–inorganic composite with an altered internal structure *via* doping selenium (Se) cations into the lattice of HAP. We have synthesized Se-substituted HAP (Se-HAP) composites with different Se/P ratios (0.01, 0.05, and 0.1 M) *via* a wet chemical route in which two different sets of samples were collected (1) after only precipitation (referred to as the precipitation method) and (2) after precipitation followed by sonication (referred to as the sonochemical method). FTIR and Raman spectroscopic analyses confirmed the successful doping of Se into the HAP matrices, while powder XRD studies indicated their highly crystalline nature, which was significantly influenced by Se doping. The XRD data

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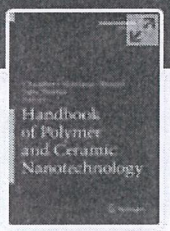

Handbook of Polymer and Ceramic Nanotechnology pp 99–120 | Cite as

Alkaline Earth Stannate Nanomaterials as an Electron Transport Layer in Dye-Sensitized Solar Cells

Ashok Kumar, Sarath Chandra Veerla, Kabali Vijai Anand & Astakala Anil Kumar

Reference work entry | First Online: 25 August 2021

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Abstract

Dye-sensitized solar cells belong to the third generation of solar cells. They have been getting much attention recently among the scientific community due to the facile manufacturing process and competitive power conversion efficiency. Conventionally, the mesoporous TiO_2

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Applications, Fabrication and Commercialization

Micro and Nano Technologies

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Chapter 7 - Fabrication of chemiresistive gas sensor with carbon materials/polymers nanocomposites

Sarath Chandra Veerla [1], N.V.S.S. Seshagiri Rao [2], Anil Kumar Astakala [1]

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Chemiresistive sensors fabricated using the semiconductor metal oxides (SMOs) are used widely in sensing the hazardous gases and chemicals present in the environment. These sensors are used in medicine, automobile, and electronic industries. Recently, the carbon

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Metal ions are very much essential in the human life processes. Heavy metal ions were the most important trace elements existing in our human body. In the past two decades, metal

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PAPER

Biogenic synthesis of stable silver nanoparticles via *Asparagus racemosus* root extract and their antibacterial efficacy towards human and fish bacterial pathogens

P P N Vijay Kumar[1], R L Kalyani[2], Sarath Chandra Veerla[3], Pratap Kollu[4], U Shameem[7,5] and S V N Pammi[7,6]

Published 30 August 2019 • © 2019 IOP Publishing Ltd

Materials Research Express, Volume 6, Number 10

Focus on Nanoscience and Nanotechnology

Citation P P N Vijay Kumar *et al* 2019 *Mater. Res. Express* 6 104008

DOI 10.1088/2053-1591/ab3ce9

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Abstract

Herein, we demonstrate the synthesis of silver nanoparticles via a greener approach using *Asparagus racemosus* root extract and stability and antimicrobial activity of fabricated Ag NPs were evaluated. The Ag NPs were synthesized using the $AgNO_3$ source with *Asparagus racemosus* root extract as a capping and reducing agent. The prepared Ag NPs were characterized using UV–visible, SEM-EDX, XRD, TEM,

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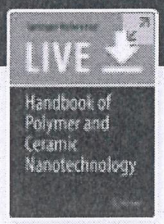

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Recent Developments on Nanosized Metal-Incorporated Calcium Phosphate for the Treatment of Malignant Tumors

Sarath Chandra Veerla ✉, Astakala Anil Kumar, Kabali Vijai Anand & Ruddaraju Lakshmi Kalyani

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Volume 25, December 2020, 101574

Synergetic antibacterial potential, dye degrading capability and biocompatibility of *Asperagus racemosus* root assisted ZnO nanoparticles

Panduranga Naga Vijay Kumar Pallela [a], Lakshmi Kalyani Ruddaraju [b], Sarath Chandra Veerla [c], Ravichandra Matangi [d], Pratap Kollu [e], Shameem Ummey [a], S.V.N. Pammi [f]

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Abstract

In recent decades, increasing awareness towards green chemistry has led to a desire to develop an eco-friendly approach for the synthesis of nanoparticles especially through

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Influence of sonication on the physicochemical and biological characteristics of selenium-substituted hydroxyapatites

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Author affiliations

Abstract

Although the material hydroxyapatite (HAP) has excellent porous, biocompatible, and biodegradable properties, its mechanical strength and microbial inhibition rate are not adequate for its direct use in bone tissue engineering or in constructing artificial teeth. To overcome some of its limitations, in the present study, we have formed an organic–inorganic composite with an altered internal structure *via* doping selenium (Se) cations into the lattice of HAP. We have synthesized Se-substituted HAP (Se-HAP) composites with different Se/P ratios (0.01, 0.05, and 0.1 M) *via* a wet

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Green-synthesized copper oxide nanostructures for potential multifaceted biomedical applications†

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Lakshmi Kalyani Ruddaraju,[a] Sarath Chandra Veerla,[b] Venkata Ramana Murthy Kolapalli,[c] Panduranga Naga Vijay Kumar Pallela,[d] Veerabhadra Swamy Padavala[a] and S. V. N. Pammi *[c]

Author affiliations

Abstract

In the present study, *Annona squamosa* leaf extract was used as a reducing and capping agent for the facile green synthesis of nano-copper oxide (nano-CuO) particles. The optical, structural and morphological properties of the as synthesized nano-CuO were analyzed using UV-Vis, zeta potential, SEM, TEM, XRD, FTIR, and Raman analyses. Formation of nano-CuO particles and their size was initially confirmed by UV-Vis spectroscopy and zeta potential analysis. The results from SEM, TEM, XRD and Raman analyses confirmed the monoclinic structure of CuO with 2D leaf-shaped morphology in the nanoscale with uniform symmetry. The FTIR spectrum indicates the functional groups in *Annona squamosa* leaf extract that are accountable for the CuO formation and bonding nature of CuO.



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New Journal of Chemistry

Green-synthesized copper oxide nanostructures for potential multifaceted biomedical applications†

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As the number of distributed power systems that use non-linear loads has increased, improving power quality has become a top priority for academics. In this work, we look at how the harmonics in a distributed power system may be reduced with the use of a device called a Distribution Static Synchronous Compensator (D-STATCOM). When compared to other FACTS devices, D- STATCOM has more reliable voltage stability because to its built-in voltage regulator. As a result of its high voltage-gain ratio, LUO converter is employed. Using an ANFIS -based MPPT (Maximum Power Point Tracking) guarantees regulated output and facilitates the extraction of maximum power from the PV panel. The DFIG-based WECS utilises a PWM rectifier, which is in turn controlled by a PI controller, to complete the AC-DC conversion. Reference current generation is essential for harmonic removal, and this is achieved by the Hysteresis Current Controller. MATLAB is used to simulate the complete regulated process, and the results show that the suggested method provides higher power quality with less distortion than other methods.

Published in: 2022 International Conference on Automation, Computing and Renewable Systems (ICACRS)

Date of Conference: 13-15 December 2022

INSPEC Accession Number: 22596897

Date Added to IEEE *Xplore*: 07 February 2023

DOI: 10.1109/ICACRS55517.2022.10029191

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Rapid exhaustion of fossil fuel energy systems, emission of carbon, and climate change issues has been paid more attention in the recent scenario. The development of power electronic devices, the growth of industries and population increases the need for green energy. The Hybrid renewable energy of wind and PV system are the better choice due to the benefits of the reliability of power based on the weather condition, an extension of the grid system, and remote electrification. In this research, the isolated grid integrated multilevel inverter for hybrid (Solar and wind) battery-based fly back converter application is proposed with optimal controlling techniques. The primary objective of this research is to design and develop the fly back converter with an effective controller to obtain the higher power output during the operation of continuous and discontinuous conduction mode respectively. Even though, the researchers are mostly implemented with Cascaded H-Bridge (CHB) inverter-based grid-tied system. CHB are increasing the harmonics, the requirement of the filter circuit and overall efficiency. To solve these issues thirty-one level inverter is proposed by considering intelligent techniques as a secondary objective. The modeling and controlling techniques of the discussing system are done by MATLAB tool. The prototype setup provides the experimental feasibility of the developed hybrid PV-wind connected fly back converter with a thirty-one-level inverter-based grid-tied system by considering the reliability of intelligent controller system.

Published in: 2023 5th International Conference on Smart Systems and Inventive Technology (ICSSIT)

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INSPEC Accession Number: 22810440

Date Added to IEEE *Xplore*: 14 March 2023

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The purpose of this research is to come up with an original design for a high-step-up dc-dc converter that might be used in decentralised power plants. This concept is built on a foundation of a pair of capacitors and a single inductor that is coupled together. The energy that is stored in the connected inductor is used to charge the two capacitors in parallel during the time when the switch is off and to discharge them in series during the time when the switch is on. This results in a high step-up voltage gain. In addition, the energy lost by the linked inductor's leaky inductance may be recycled via the use of a passive clamp circuit. As a result, the strain that the primary switch experiences from the voltage is minimised. Utilizing a switch that has an RDS that has a low resistance may help reduce the amount of conduction loss (ON). Since the problem with the diodes' reverse-recovery has been fixed, the efficiency could be able to be improved even more. There is a focus on providing in-depth descriptions of the operating principle as well as steady-state investigations.

Published in: 2023 Fifth International Conference on Electrical, Computer and Communication Technologies (ICECCT)

Date of Conference: 22-24 February 2023

Date Added to IEEE *Xplore*: 21 July 2023

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INSPEC Accession Number: 23456499

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The purpose of this research is to come up with an original design for a high-step-up dc-dc converter that might be used in decentralised power plants. This concept is built on a foundation of a pair of capacitors and a single inductor that is coupled together. The energy that is stored in the connected inductor is used to charge the two capacitors in parallel during the time when the switch is off and to discharge them in series during the time when the switch is on. This results in a high step-up voltage gain. In addition, the energy lost by the linked inductor's leaky inductance may be recycled via the use of a passive clamp circuit. As a result, the strain that the primary switch experiences from the voltage is minimised. Utilizing a switch that has an RDS that has a low resistance may help reduce the amount of conduction loss (ON). Since the problem with the diodes' reverse-recovery has been fixed, the efficiency could be able to be improved even more. There is a focus on providing in-depth descriptions of the operating principle as well as steady-state investigations.

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Microgrid Design For EV Fast Charging Station Using Interleaved DC-DC Converter

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Abstract:

The development of a microgrid for an electric vehicle charging station that makes use of a variety of renewable energy sources is the major objective of this project (utility grid, solar PV plant, wind energy system). In this instance, the solar array is anticipated to produce 15 kWp, while the wind turbines are anticipated to produce 5 kWp. A distributed energy system's efficiency and performance may be significantly improved by the use of a dc-dc converter and the perturb and observe method of maximum power point tracking (mppt). Both of these techniques are part of the maximum power point tracking (mppt) protocol. The configuration that has been proposed is helpful for constructing a locally characterized microgrid that is not only functional but also cost-effective. This is a novel component that has been included to this research since it would reduce the need for the electric grid during peak demand periods, which is a significant challenge faced by contemporary megacities.

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Modeling and Controlling of AC/DC Hybrid Microgrid

Publisher: IEEE Cite This PDF

D. Ravi Kishore ; Muchhupalli Saimanoj ; Adapala Sri Venkata Sai Kishore ; Devadi Hari Krishna Veerendra **All Authors**

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Abstract:
As a result of climate change, renewable energy sources like solar and wind have become the most popular choice for distributed generators (DGs). Power sources including wind, solar, biomass, mini-hydro, fuel cells, and microturbines will help boost decentralised power production. Electricity systems may benefit from distributed generation in a number of ways, including environmental friendliness, scalability, and the use of nonconventional microsources. A regulated microgrid is comprised of loads and distributed generators. Microgrids may function whether or not they are connected to the main power grid. Microgrids provide power system connections to variable renewable AC and DC sources and loads while minimising the need for reverse conversions in AC or DC grids. Connecting DGs to the utility/grid through power electronic converters raises questions about the security and integrity of the connected systems. Local dependability, feeder loss reduction, local voltage support, waste heat utilisation, voltage sag correction, and uninterruptible power supply are just some of the client demands that may be met by tailoring the microgrid to their specific requirements. In order to better understand how hybrid AC/DC microgrid systems function when connected to the mains, this research evaluates their efficiency. Microgrids use renewable energy sources such as solar panels, wind turbines, and batteries. The DC and AC sub-grids are synchronised by the manipulation of converters. MATLAB/Simulink is responsible for generating the results.

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INVESTIGATION ON PERFORMANCE OF HEMMPRODUCTIVITY IN OPEN CAST GRANITE MINES

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ABSTRACT:

Mining is economically important to develop regions and countries. Also mined minerals are needed to construct buildings, roads, hospitals,automobiles & houses, to make computers&satellites and to generate the electricity.Open cast mining plays an important role in today's world of exploration of minerals. Machinery plays an important role in the opencast mining as we all know mining is mainly dependent on the machines these days and it is important to know about the type of HEMM that we are using for production. Productivity of any mine is based on type of machinery employed.An attempt has been made in this paper to calculate the percentage of availability, percentage of utilization of HEMM employed in open cast granite mines. It also analyses the contribution factors to improve the overall equipment performance.

KEYWORDS: Availability, Utilization, Idle time, Break-down hours, Maintenance hours.

1. INTRODUCTION

Opencast mining is coming up on a large scale in the mechanized form in world. Because development in the fields of mining is largely depends on the HEMM that we employed in the mine in other words existing Heavy Earth Moving Machinery is the back bone for development of mine.As we know mining involves in large capital investments by adopting automated machines for extraction of minerals. Mine managers should focus on the effective utilization of the equipment so as to get early returns(economy) on their investments.Because of the negligence in maintenance of equipment and machinery, it shows huge difference in their utilization.

Some studies reveal that maintenance cost of the opencast mining equipment varies from 35-50% of the total operational cost in mechanized mine.If the maintenance is not carried up to the adequate level, the mining machines can result into lower speed of operation and may lead to replacement of the costly equipment.Percentage of availability and percentage of utilization of the HEMM mainly depends on Idle hours, maintenance hours, and breakdown hours. we can calculate availability and utilization percentage with help of these three main factors.

STUDY OF ENVIRONMENTAL IMPACTS OF AN OC MINE

[1]A. Sandeep kumar, [2]T.Anil Kumar, [2]J.Manikantaswamy, [2]V.Tejkumar,

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ABSTRACT:

Environmental Impact Assessment is one such which monitors, evaluate and safeguards the environmental impacts and find solutions for imbalances occurred due to mining activities. In this paper an effort has been made to study the environmental impacts imposed due to mining activities in Opencast Granite mines. The main aim of this paper is to understand the role of mining impacts on the environment, controlling those impacts keeping them to lowest possible levels, procedures those will be followed in maintaining eco-friendly atmosphere. In this paper, controlling factors relating to the environmental in the mining areas pollutions like, Air pollution, Soil pollution (or) Land degradation, Water pollution and Noise (or) Sound pollution are briefly monitored and analysed from the data collected from a granite mine in chimakurthi regions.

Keywords: Environment, mining, impact, pollution, ecology, socio-economic, monitoring

INTRODUCTION:

Extraction of minerals from the Earth For these reasons proper guidelines should be followed to manage the damage and controlling measures are to be proposed according to particular mining area considering all the factors. Environmental Impact Assessment (EIA) is the process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human health impacts, both beneficial and adverse. This procedure involves the systematic identification and evaluation of the impacts onthe environment can be used by a proposed project.

Environmental Impact Assessment can be broadly defined as the systematic identification and evaluation of the potential impacts (effects) of proposed projects plans, programmers or legislative actions relative to the physical, chemical, biological, cultural and socioeconomic components of the total environment.

STUDY OF CAUSES OF POLLUTION AND ITS MONITORING IN QUARRIES

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ABSTRACT:

Granite industry is considered as a rapidly growing, and potentially sustainable industry. Nevertheless, quarrying activities induces detrimental impacts on, local community, quarry workers, livestock and wild animals. This paper was aimed to study the causes of pollutions such as air, water, noise and its monitoring in quarries. Due to the improper planning and negligence of regulations, an identifiable amount of ecological and environmental degradation damage occurs. The study revealed that the quarry workers who are engaged in semi mechanized and mechanized quarries are prone to high source of pollution and facing more health problems. The data collected from the granite mine located in Chittoor district is analysed to know that the quarry workers have been significantly affected with in specified area of study due to their occupational work.

***Key words**: Air pollution, Water pollution, Noise pollution.*

INTRODUCTION:

Mining is a crucial industry for industrial and economic progress of any country. In India majority of minerals came from opencast mines. Opencast mining is more damaging to the environment than underground mining. The major environmental issues that will arise out of the OC activities are water, air, and noise pollution.

Pollutions in the surface mining areas are caused by blasting, drilling, material loading and unloading, over burden loading and unloading, road transport etc. [3]. Pollution is the addition of any contaminants into the natural environment that leads to adverse effect to the environment. Mining operations can adversely deform the pre-existing ecosystems, and will change hydrological and hydrogeological regimes. This adverse impacts of quarrying activities induces damage in property, loss

BREAK EVEN ANALYSIS OF AN OPEN CAST MINE

[1]A Sandeep Kumar, [2]S Sai Kumar, [2]P Balakrishna, [2]A Anil, [2]T Ravi

[1]Assistant Professor, [2]UG Scholar

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Godavari Institute of Engineering & Technology (A), Rajamahendravaram, A.P, India.

ABSTRACT:

Open cast mine is major to consider the quality and value of the mineral in the potential pit. Open cast mining that produce building construction materials and valuable minerals are usually mentioned to as open pits. The B.E.P (Break Even Point) is when the total cost consist both the variable and the fixed cost. For any open cast mining, it is important to determine their breakeven point to help them in the decision-making process.

In this paper the required data is collected from an opencast granite mine. the data used were costs, data companies production and price data from factors that affected the heavy mining equipment's operation. Production was analysed by using B.E.P (Break Even Point) analysis, whereas for purchasing or purchasing on leasing was using sensitivity analysis and incremental analysis. Based on processing data and its analysis, it shows that granite production in 2016-2018 would still be in a form of breakeven. Estimation results of production in 2016-2018 is to maintain the safety limit production showed that production of granite would also still be in the form breakeven point.

***Key words**: Break-even point, Break-even analysis, Production, Fixed cost, Variable cost, Concept of cost, Profit etc.*

1. INTRODUCTION:

A business firm is interested in maximization of profits. Profits are measured as the difference between total cost and total revenue. $\pi = TR - TC$. Where π = profit, TR = Total revenue, TC = total cost before a firm plan for profit maximization it has to determine the break-even quantity or value of output it should produce. It is the maximum output that a business unit should produce in order to avoid any loss. Break-even point defines as a point where a firm neither gets profits nor losses. It is a point of no loss and no profit. In other words, break-even point is the point where firm leaves the loss zone and enters the profit zone. Break-even analysis has wide ranging implications to a business manager. It is useful in understanding the costs, profit, revenue,

STUDY OF ENVIRONMENTAL IMPACTS OF AN OC MINE

[1]A. Sandeep kumar, [2]T.Anil Kumar, [2]J.Manikantaswamy, [2]V.Tejkumar,

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ABSTRACT:

Environmental Impact Assessment is one such which monitors, evaluate and safeguards the environmental impacts and find solutions for imbalances occurred due to mining activities. In this paper an effort has been made to study the environmental impacts imposed due to mining activities in Opencast Granite mines. The main aim of this paper is to understand the role of mining impacts on the environment, controlling those impacts keeping them to lowest possible levels, procedures those will be followed in maintaining eco-friendly atmosphere. In this paper, controlling factors relating to the environmental in the mining areas pollutions like, Air pollution, Soil pollution (or) Land degradation, Water pollution and Noise (or) Sound pollution are briefly monitored and analysed from the data collected from a granite mine in chimakurthi regions.

Keywords: Environment, mining, impact, pollution, ecology, socio-economic, monitoring

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Extraction of minerals from the Earth For these reasons proper guidelines should be followed to manage the damage and controlling measures are to be proposed according to particular mining area considering all the factors. Environmental Impact Assessment (EIA) is the process of evaluating the likely environmental impacts of a proposed project or development, taking into account inter-related socio-economic, cultural and human health impacts, both beneficial and adverse. This procedure involves the systematic identification and evaluation of the impacts onthe environment can be used by a proposed project.

Environmental Impact Assessment can be broadly defined as the systematic identification and evaluation of the potential impacts (effects) of proposed projects plans, programmers or legislative actions relative to the physical, chemical, biological, cultural and socioeconomic components of the total environment.

STUDY OF FRAGMENTATION SYSTEMSIN AN OPEN CAST IRON ORE MINE

[1]A. Sandeep Kumar, [2]A. Nagasai, [2]B. Madhu Naidu, [2]CH. Koti Reddy, [2]K. Uday Kumar.

[1]Assistant professor, [2]U.G scholar

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ABSTRACT:

This paper effort has been done to study the fragmentation systems in an open cast iron ore mine. For the economic expansion of any country mining industry plays an outstanding role. In open cast iron ore mine, drilling and blasting plays an important role for the production from an open cast iron ore mine the information is taken to study the fragmentation systems. It is so enticing to have a uniform fragment distribution, avoiding both fines and oversized fragments to overall cost of mining. Here, few situations which regulate the fragmentation i.e., explosive properties, geometry of the strata etc. In mining operation the primary aim is to achieve ultimate extraction of minerals care in aspect the environmental, economic and lease compulsion. The fragmentation of the rock depends upon drilling and blasting operations. Development in production has been accomplish with the help of generous capacity opencast machineries, endless mining system with better-quality design.

Keywords: Environmental, Economical, Fragmentation, Production.

1. INTRODUCTION:

The Drilling and blasting performances are conducted for extraction of iron ore in open cast mines[1]. Due to blasting air blast, flying rocks, back breaks, noises etc. These are not escapable and cannot be completely eradicate but certainly minimize up to permissible level to eliminate damage to the neighboring environment with the present structures. Among all the adverse effects, ground vibration is a matter of major burden to the planners, designers and environmentalists. A number of inquirers have considered several methods to dilute the ground vibration level in the meanwhile of blasting operation. Ground vibration precisely bank on the quantity of explosive used and distance between blast face to checking point as well as geological and geotechnical conditions of the rock units in excavation area[2].

STUDY OF TRANSPORTATION SYSTEM AND SAFETY MANAGEMENT

[1] A. Sandeep kumar, [2] P. C. Aditya, [2] S. Arshad Navaz, [2] N. Chandra Sekhar, [2] P. Venkat Rao,

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ABSTRACT:

Transportation of ore as well as over burden in an open pit mine represents most complex process in the open pit excavation technology. The productivity and production cost of the open pit mine will depend upon the transportation system equipped. Also it will discuss safety in hard rock mining, hazards and dangers involved in surface mining activities. In this present work the attempt has been made to know the type of transportation machinery used in surface mines and to calculate the efficiency, performance of transporting machinery. It also discusses about the safety management in hard rock mining. The data collected from chimakurthy granite mines.

KEYWORDS: Transportation, surface mining, main hazards, effects of hazards, control measures, safety.

1. INTRODUCTION:

Transportation at the open pit mine take place according to the determined cycle, the duration of the transportation will depends on a time of loading, motion of empty and loaded transport machine, unloading, maneuvering and stoppage in transport. All these operations can be performed with or without any interruptions, and therefore, transportation of open pit mine can be divided into:

- Continuous (such as hydrotransport, belt conveyor)
- Discontinuous (with intermittent effect, such as trucks, trains, scrapers)
- Combined (for example truck transport with belt conveyor)

Selection of transportation system will depend upon:

- Physicochemical and mechanical properties of a material
- Working environment in which transport machinery will work
- Disposal direction and transport distance, etc. [5]

STUDY OF PRODUCTION PLANNING & SCHEDULING IN AN OPENCAST MINE

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ABSTRACT:

Mining is the process of extraction of minerals sited deep in the Earth's crust by using various techniques.Production planning provides clear idea about utilization of manufacturing resources for production.. In this paper, an attempt has been made to study the production planning and scheduling of resources in an open cast granite mine. Production planning and scheduling involves the sequencing operations, anticipating possible difficulties and deciding the best and most economical way of carrying out the operation. Production planning and scheduling gathers past production data and estimate the future production.

KEY WORDS: Production, Planning, Scheduling, Time

INTRODUCTION:-

Production planning and scheduling can play a key role in any business organization or manufacturing industries [2] (mining industry). Here production is a process, consists of a sequence of operations of converting raw materials into finished products [3]. Planning is thinking ahead of doing. Planning anticipates the possible difficulties in advance and decides the best and most economical way of carrying out the production [1]. And scheduling is the process of allocating works to the men and machines for improving the work performance and reduces time wastages [4].Mine production scheduling are two types they are long term production scheduling and shot term production planning[5].

ROLE OF MACHINE IN MINES:-

The systematic planning of any production activities is highly depends on the type of machinery used to perform that activity. In this regard a detail study of machinery type which are using in the field, become necessary for deciding the systematic planning.

STUDY OF VENTILATION IN UNDERGROUND MINES

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ABSTRACT

The observations presented in this paper, primarily, pertain to mine ventilation. which includes the present study deals with a careful investigation of parameters like effect of pressure, air velocity, heat and its effects, and type of ventilation system on mine ventilation in Mica mine, Nellore district, Andhra Pradesh, India. The types of survey which studied in this project is quantity survey, pressure survey and qualitative survey. Results identified while studying is, with the increase in mine depth the velocity of air blowing in to the mine decreases and temperature increases. Based on mine data, a correlation has been developed for the prediction of velocity of air with mine depth using method of least square.

Keywords: Air velocity, Pressure survey, qualitative survey, correlation.

INTRODUCTION

In an era of rapid development of the global economy, the energy dependence is increasing rapidly. As the shallow mineral resources on earth's surface have been depleted, countries worldwide have successively begun to mine deep resources[4]. As the mining depth increases, the temperature of the rock increases, and the heat damage caused by the ground temperatures and other factors is amplified and finally affecting mine ventilation.

Mine ventilation systems are important for the safe operation of underground mines and provide fresh airflow and remove the contaminated air, also lower the heat humidity of the working surface. Poor ventilation in the work area is one of the main causes of high temperatures and heat damage

STUDY THE METHOD OF WORKING USED IN GRANITE MINES-A FIELD OBSERVATION

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Abstract : This paper presents a detailed overlook the practiced method of mining used in granite mines to extract the mineral by avoiding artificial cracks. This paper gives a glance of scientific extraction of granite extraction in the mining industry. As the quality of granite shows high impact in sales, quality maintenance therefore during extraction process it is very important to know the scientific technique of granite extraction. The blasting and transportation of overburden and waste rock is also studied in this paper.

***Key words*- Granite, artificial cracks, extraction, blasting.**

I.INTRODUCTION

The importance of granite having a significant role in any building related structural activity [1]. Granite is a type of igneous rock which is formed when magma is cooled. It having a highly durable and good shear strength characteristic in nature. In general, it is used in the design and building the constructional activities [2]. Quartz and feldspar are the main chemical composition of the granite [3]. Apart from these two the other components such as amphiboles, mica etc. are present in small amounts. The molten rock is formed due to the decaying process of radioactive elements for a long time [4]. This rock is extremely durable and hard, making it the perfect substance for construction uses such items as countertops or floorings. It is a common type of felsic intrusive igneous rock which is granular and phaneritic in texture. It can be predominantly white, pink, or gray in color, depending on their mineralogy constituent [5-6]. It has an enough size of grains large which can be visible to naked eyes. Granite is used in many outdoor and indoor projects. The outside projects such as bridges, monuments, buildings, paving etc., and inside projects such as countertops, floor etc [7-8]. Since, granite is a world's toughest substance (which is used since thousands of years) thus it can be used in curling balls and gym walls for training mountain climbing [9]. The granite usage in different form are as follow:

1. Building monuments
2. Granite used in jewellery
3. Granite used in fireplace mantle and floor
4. Granite used in bathroom skins, shelves, table tops, basins

As the granite is an economical mineral, thus a proper method should be adopted for its efficient extraction. The extraction procedure of granite should be carried out in such a manner that it can maintain its quality as describe on the scale. The proper and scientific method of working of granite helps to avoid artificial cracks [10]. There are three ways of extracting granites which create varying levels of quality. The three ways of extracting granite are blast extraction, air bag extraction and stone extraction. The aim of this paper is to study the proper and scientific practice method of working which is applying in a granit mines.

II. ROLE OF MINING METHODS IN MINES

The method of mining plays a very key role in any mining industry or queries. As the granite is associated with queries (i.e., building related material) and which is also an economical mineral. Therefore, the extraction of granite should follow the careful method which is capable of extracting without creating artificial defects on it. The semi-mechanized open cast method is using to extract the mineral (Black galaxy granite) to avoid the damages. The same method will be adopted during the scheme period. The quality of granite is dependent on the way that the granite is mined or extracted.

Black galaxy granite is another type of economical mineral. Which further required a separate method extraction. Diamond wiresaw is used for separation of final block from parent rock. Cracking powder is used for splitting of the blocks. Dressing is done to get a well-shaped block which are free from defects. The mechanism of blasting is to be used only for breaking the over burden and waste rock material. For transportation of the loose material the dumpers and wheel loaders are used in the mining industry.

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CASE STUDY ON BLASTING GALLERY METHOD

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ABSTRACT - *In the mining industry, the challenging task of mining professionals comprises the extraction of maximum natural resources along with the safety of the miners. A comprehensive study of this method of mining in the technical and technological analysis is allowed for its effective application. Conventional bord and pillar mining in thick seams is associated with a very low percentage of extraction [around 30% in a panel] even under favorable conditions. Due to the low percentage of extraction of reserves by B&P, most of the mines have chosen the Blasting gallery method of extraction to improve their rate of extraction. so, A detailed view of the Blasting Gallery method, Design of blasting technique, and mechanization works in the blasting Gallery method is carried out in this paper. Here, around 50% of coal reserves in India are found to have a seam thickness of about more than 4.5 mts which considered and called as thick seams. The exploitation of thick seams by underground methods arises certain difficulties and problems. The blasting gallery method is the appropriate method for the extraction of thick seams having 8 to 11mts. Mining by this method produces around 1000Tonns/day with 85% of extraction. At present in India, Telangana state is implementing the B.G. Method in SCCL, GDK—11, and no. 21 incline Yellandu.*

Keywords: Natural Resources; Blasting gallery method; Unique Techniques; Exploitation;

1. INTRODUCTION

Commencing into the theme Blasting gallery method. For most, we have to familiar with mining. Generally, mining is a process of extraction of valuable minerals from the earth, usually, from an orebody, lode, vein, (or) reef. Generally, the mining industry contributes nearly 80% of civilization throughout the world. As we go with the normal method of mining i.e. Bord and pillar method. It is barely used up to 5mts Only and the percentage of extraction is less. To get the better of these, the blasting gallery method used for a seam up to 20mts. The method is most successful for the percentage of extraction as well as safety and mechanization. The method was very successful resulting in 85% of extraction with high productivity.

Strata control or roof control implies the control of the strata to facilitate mining operations to be done efficiently and safely. Not only we are concerned with the roof falls and uncontrolled failure of strata or structure in the rock but also with the harnessing of the strata pressure to advantage so that there is the ease in coal getting. There is less emission of gas and less production of dust and also the caved strata fill the goaf solid so that the risk of spontaneous heating is minimized.

The strata on the face, and in the adjoining area, i.e. in front and behind, must require attention so that no uncontrolled failure of the ground takes place. To design satisfactory strata control measures, it is essential first to have a clear understanding of the mechanics of the movement of the ground as a result of the mining operation.

In thick coal seams, coal bed forms the roof of the lower slices. A coal layer at the roof normally forms a good roof. But coals with joints and cleats are prone to fail without warning. Some seams have coal balls, nodules, or rounded fragments, and these may fall unnoticed and cause fatalities. When coal bed is undermined, it may also develop induced cleavages and fractures and in such situations roof falls are common. So for complete or maximum extraction of such coal seams, the Blasting Gallery method is introduced.

The first Blasting Gallery method of extraction was introduced in SCCL in 1989 at GDK No.11 Incline and being worked successfully. Although the first BG in India was introduced in East Katras Colliery of Jharia Coal Fields, BCCL and Chora Colliery of Raniganj Coal Fields, ECL in 1987, the workings were abandoned in East Katras Colliery due to Strata Control Problem and were discontinued in Chora Colliery due to premature Spontaneous heating problem. GDK-11 Incline mine falls in Godavari Valley Coal Fields of Singareni Collieries Company Limited and is situated in Telangana.

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A Brief Overview on Different Stages in a Overall Life of Mine

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Abstract: *Life cycle of mine begins with different stages (i.e., Prospecting, Exploration, Development, Extraction, Reclamation stage). The time period required for each stage decides the overall life of a mine. Every miner has huge burden before start a new mine. To start and which permissions have to take from government and other departments through-out overall life of mine. This study is carried out to know about different stages in mine life and their preliminary requirements. Majorly in mining field illegal activities are easily carried out against the Government rules. So, for legal mining which permissions needs to take from Government and other departments. In day to day working environmental (Mining or other fields) safety is the major aspect, for this safe working environmental every mine needs to follows some important plans in a day to day mine life. Finally, this paper covers a complete guide notes for every miner about different stages in mine life, permissions needs to take from the government, mine plans for safe working environment.*

Keywords: Mine life; Stages In Mine; Mine Permiss -ions; Forms; Plans;

1. INTRODUCTION

Mining is the life time process for extraction of valuable minerals (or) geological materials from the earth, usually from an ore body, lode, vein, seam, reef, (or) place deposit. These deposits form a mineralized package that is of economic interest to the miner. Everything we depend on is either made from minerals (or) relies on minerals for its production. Once look around us to observe the objects you're surrounding things, by which are not manufactured by plant-based resources. That is only happening by mining process. It rise and else man then utilize to other purpose. Mining industry supports every day in our life but also provides the foundations of engineering achievements for the decades to come. In this contemporary world we can't assume without industries, technology, automobiles and else. So we have to give support our mining industries. To extract these deposits, mining cyclic operations shall be occurred.

1.1. STAGES IN MINE LIFE

There are mainly five stages in a life of mine, they are

- PROSPECTION STAGE
- EXPLORATION STAGE
- DEVELOPMENT STAGE
- EXPLOITATION STAGE
- RECLAMATION STAGE

Prospecting Stage

It is the first stage in search of ore. In this stage we study the literature and maps of an area. This can be done by

1. Direct Method: It is limited deposit surface(or)near surface. It consists of visual examination of either outcrop(or)loose fragments that have weathered away from the outcrop. The samples are collected in laboratory. Video prospecting.

2. Indirect Method: This can be used for deeper deposits. They includes seismic radiometric, magnetic and many other method.

Exploration Stage

This is the second stage of mining. Core samples are obtained by diamond drilling. Different laboratory analyses are carried out to evaluate the grade and tonnage of deposit. Video core samples, diamond drill bit and core samples and diamond drilling.

Final conclusion's drawn regarding worth of the deposit. At the end of this stage feasibility study is carried out which helps to decide, whether to abandon(or)develop the deposit.

Development Stage

It is work of opening a mineral deposit for exploitation. In this stage mining rights are acquired. Ore handling and treatment plants constructed near the mine then access to deposit may be gained by

1. Stripping overburden(Surface mining).

2. By excavating opening from surface to more deeply buried deposit(Underground Mining).

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CASE STUDY OF CONTINUOUS MINER ALONG WITH ROOF BOLTER

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Abstract - *This method is introduced to overcome the problems occurred due to the geological disturbances and introduce the latest technology. This process eliminates the drilling and blasting operations and implementation of latest and technology. This helps in use of latest method of roof bolting in place of manual roof bolting. The roof bolting and continuous mining operation helps in great increase in the development of output and avoid of dangers due to roof fall, side fall and any other kind of dangers. The continuous miner loads the coal into the shuttle car and car transports the coal to desired spots. The whole machinery is powered with load canter. Continuous miner technology helps in achieving high production and faster rate of extraction with safety. Continuous miners and shuttle cars combination are used to transport the coal from face to a transfer point (feeder breaker).The present study has been aimed for optimum utilization of continuous miner by examines the performance analysis of continuous miner and also designing of support system under various roof conditions such as: At roadways and junctions, The area intersected with slips and faults, During depillaring. From the collection of borehole data at various locations of continuous miner panel different rock properties are drawn and for designing of support system CIMFR – RMR classification was used. From the performance analysis of continuous miner the reliability of continuous miner is 89.87 per cent and failure probability is 10.13 per cent was achieved and also different conclusions are drawn which shortly explains an overview of all work.*

***Key Words*: Quad bolter, continuous miner, shuttle car, load center, depillaring support system**

1. INTRODUCTION

In this mechanization continuous mining method is one. This method utilizes the continuous miner with a large rotating steel drum equipped with tungsten carbide teeth that scraps coal from seam. Continuous miner not only cuts the coal but also fed the coal onto conveyor. It is generally used in room and pillar mining. Now a day's remote-controlled continuous miner is also being used in difficult conditions and robotic versions are controlled by computers.

1.1 STUDY OF CONTINUOUS MINER

Some continuous miners can bolt and dust the face while cutting. These mostly used in foreign countries such as Australia and America. Now Indian coal mines are also introducing the continuous miners for high production and safety. To accomplish higher production and safe mining condition, require high automation in underground coal mines. The utilization of continuous miner in underground mines is increasing periodically, resulting in higher productivity and safe mining conditions. To meet the ongoing demand of coal in the country, immediate attention is required for improvement in the production from underground mines. India's coal ministry wants to better utilize land to meet a growing energy demand.

2. METHODOLOGY

A continuous miner is a mining machine that produce a constant flow of ore from working face of mine. The machine continuously extracts as it is loading coal with continuous steel drum and conveyor system. Continuous miners can typically use in room and pillar mining operations. The continuous miner is different from conventional and cyclical mining methods, which hault the extraction process in order for ore loading to proceed. Continuous miners, which began to take off in Sminning industry in 1940's makeup of 45% of underground coal mine production. Today continuous miners are being developed as driver less machines controlled with remotes

Generally, board & pillar section use one continuous miner and two electric/diesel/battery shuttle cars travelling between the miner and the feeder breaker. One quadra boom roof bolter equipped with temporary roof support system and able to drill on wet.one feeder breaker, which receives coal from shuttle cars and crushes the coal to –200 mm size before it is fed to the main conveyor from electrical equipment which is load canter , centrally located at one place from which power from which power supply will be given to different equipment CM , SC , FB, QB, LHD , lighting etc., one electrically operated LHD/utility vehicle for multipurpose jobs like sweep the tramming route and maintaining gradient, to sweep the heading face, to sweep after each advance of the conveyor, to transport material and consumable goods, feeder cables during advance. Coal pillars of large dimensions are left out in underground coal mines to support the huge burden of the overlying strata for safe mining conditions. More than 3000 million tons of coal reserves are locked up in the form of coal pillars in India

2.1: DEPILLARING USING CONTINUOUS MINER:

After the formation of board, pillar pillar extraction or depillaring of coal can be carried out by continuous miner. Continuous miners typically have cutting head i.e. 3.3m wide. The machine is usually "spumed in" between o.5m and

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Optimization of Blasting Operation in Opencast Mine

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Abstract - *The mining industry is concerned with the extraction of valuable minerals from the earth. In any mining project, drilling and blasting are the first basic operations that are part of an integrated system and impact the results of subsequent operations in productivity and costs. The main objective of fragmentation with explosives is to make the operation as low cost as possible and at the same time keep the technical details in compliance with the safety conditions. This process is achieved by taking of optimization process. In the present study we attempted to evaluate the optimization of blast design by using computer program OPTIMUM BLAST MODEL. The created model is easy to use one, because it can compare explosive performance by keeping the powder factor constant and changing parameters such as drill hole diameter, number of holes and cost of explosives, and consequently make the decision to choose the right type of explosives. This model will definitely give some relief to mine operators and blasting engineers to achieve a better output at a lower cost of mining. Because modern mines require large amounts of explosives throughout the mine's life, the cost of blasting operation can be significantly reduced by reducing the cost of explosives.*

Key Words: Optimization, Drilling, Blasting, Opencast mine, Blast model, Explosives, Machinery.

1. INTRODUCTION

Pre commencement of topic to introduce MINING INDUSTRY, the mining industry plays a prominent role of economy of that county. In mining the fundamental point is to accomplish greatest extraction of minerals keeping in see the ecological, monetary and rent limitations. With the increase of human progress, the essential of various minerals has expanded complex to fulfill this need.

In mining industry the mineral resource extracted by both opencast and underground mining. In both cases the extraction is done by loosening the mineral through mainly perform the operations of DRILLING and BLASTING. In India many of the mines are working on with opencast mining and most of the mining operations are performing with drilling and blasting. The opencast working plays a crucial role in mining because of the improved productivity, recovery and safety of mining operation.

The topic is OPTIMIZATION OF BLASTING OPERATION. This topic mainly works on the study and evaluation of optimum blast and blasting parameters. In mining industry OPENCAST mining, the DRILLING AND BLASTING is the major unit operation. The BLASTING is an important process which influences directly on loading, hauling and crushing and milling phase.

Now-a-days, there are many achievements conducted in research of blasting theory and blasting parameters in mining industry, especially of blasting parameters for improving rock fragmentation and reducing blasting cost. The better result of rock fragmentation is obtained by the process of OPTIMUM BLAST. The blasting efficiency is improved through the reducing of wastage of explosive energy in blasting, less throw of blasted material and reducing of blast vibration resulting in greater degrees of safety and stability to the nearby structures.

Optimization means action of making the best i.e. to achieve maximum or minimum charge of the operating parameters. Optimization of blast is depends on a host of complex factors related to the rock, explosive, initiation, drill-hole parameters and their layout. The present operation is a step in the direction of developing a suitable blast model, with simple methodologies which can be adapted by the mining industry to achieve better blasting results.

1.1 Objectives

The goal of the investigation is to develop a result of optimum blast design through some parameters, as type of explosive, explosive quantity, blast pattern and fragmentation.

The main objective addresses towards:

1. To study the drilling methods and their machineries for effective drilling.
2. To understand the blasting parameters to their suitable working conditions.
3. To study the optimization techniques.
4. Design of optimum blast model to our recommendations.

When the trend is away from stated goals, one can correlate back to bulk truck and drill data. Once the problem is corrected, fragmentation can be monitored to insure that it is trending back to the desired distribution

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Underground Mine Ventilation – A Case Study

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Abstract – *In view of mining, Ventilation is a major aspect of an underground mine, in which it is to control the atmosphere to support miner's life and improve their efficiency. It leads to an increase the productivity and also to flush out the harmful and noxious gases to their permissible levels. This study is carried out to know the static conditions of mine which relates to the ventilation (i.e., Air velocity at roadways in mine, the existence of humidity in particular areas of the mine, the efficiency of fans at a rate of ventilating air into the mine, equivalent orifice (or) resistance of a mine, method of ventilating the air into mine, the ventilation distribution in mine and some other conditions). For ventilating the working faces, the proper controlling devices are used for coursing of air and sufficient ventilation survey techniques are to be developed to maintain the quality and quantity of air. This present paper covers a detailed view of the underground mine ventilation system, ventilation survey and different parameters that contribute to provide ventilation effectively.*

Keywords: ***Mine Ventilation; Ventilation Survey; parameters; controlling devices;***

1. INTRODUCTION

Generally, as we all know that mining operations usually create a negative environmental impact both mining activity and also after the mine has abandoned this is because of, we are going averse to the environment there will be a lot of problems (or) difficulties occurs during the Mining operation like, (producing contaminant gases &dust during drilling, blasting, transportation, etc.,) in which reduces the miner's efficiency &production (or) productivity of Mine.

So, to conquer these difficulties ample amount of "**Ventilation (or)Ventilation System**" should be provided to the miner's, who works in mines, normally the term **'Ventilation'** describes, "It means by which fresh air is introduced and circulated throughout the building, while contaminated (or) stale air is removed (or) diluted".

In the view of mine ventilation, it is an important aspect of underground mining in which it is required to clear all harmful gases, as in coal mines removes fumes from blasting and occasional exhaust from diesel equipment and also at the same time it provides fresh air to the miner's which improves their efficiency.
so, the careful study of mine ventilation is needed and it is vital to create a safe and healthy environment.

1.1. Objective

Here there are some objectives that we are going to give a brief explanation regarding the underground mine ventilation in which we are taking ventilation as our main objective or motive and the following objectives that we are going to addresses are:

- To study different ventilation systems used in mines.
- To study about ventilation parameters.
- Detailed view of the ventilation survey.

1.2. Project Background

The background of this project has been carried out (or) analyzed from the underground mine i.e., Kakatiya Khani -8 or 8A incline, Bhupalpally. The proposed project of an underground mine with a method of mining/technology (i.e. Bord and Pillar mining method). In which we have analyzed from the below-mentioned seams in mine they are,

- 1 seam average thickness of 2.5 mts to 3.30 mts.
- 2 seam average thickness of 2.5 mts to 3.30 mts.
- 3 seam average thickness of 3 mts to 3.60mts.

2. DIFFERENT TYPES OF VENTILATION SYSTEMS

Depending on the type of mine and disposition of local geology, the ventilation system is chosen, the basic ventilation systems are:

- U-tube system.
- Through-flow arrangement system.

2.1.1. U-tube system:

In u-tube system air flows towards and through the working area then returns along the adjacent airways, often separated from intakes by long pillars of stoppings. The airflow between the intake and returns is facilitated by access doors fitted in the stoppings.

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Case study of Types of explosives used in Granites mines

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Abstract -*Nowadays, since the explosive liquids can easily be obtained by mixing simple substances, the electromagnetic methods developed for safety purposes have gained acceleration. In this study; liquids which may be explosive with chemical explosion, combustion and combination, as well as, non-explosive liquids which may be found inside baggages in airports are used to measure electromagnetic responses ranging from 1-50 GHz and complex permeability coefficients are calculated with commercial software. Explosive and non-explosive dielecssified a with the help of three different algorithms such as PLS, PCA and K-Means.*

There is an ever-increasing need for the development of new energetic materials for explosive applications. This include but is not limited to, the area of primary explosives and secondary high explosives. Primary explosives (or "primaries" as they are colloquially called) are defined as energetic materials that possess an exceptionally high initiation sensitivity to impact, friction, electrostatic discharge, heat, and shock. Primaries are known to reach detonation very quickly after such an initiation event. The large amount of energy released upon initiation of a primary—typically in the form of heat or a shockwave—is used to initiate less sensitive energetic materials, including secondary explosives, propellants, and pyrotechnics. Despite their highly sensitive nature, primaries are, in general, less powerful than secondary explosive materials In other words, primaries typically possess lower detonation velocities, detonation pressures, and a lower heat of detonation than a given secondary explosive. Despite the lower energy of a primary, extreme care is urged when handling these materials.

Primaries are ubiquitous in both military munitions and commercial items, where their main function is to serve as the key ingredient in initiators such as detonators, blasting caps, and pyrotechnic percussion primer formulations. By far, the most commonly used primary explosives by the U.S. military are lead azide (used most often in detonators and blasting caps) and lead styphnate (most often found in percussion primers). There has been significant interest in recent years to develop new primary explosive materials, as the lead content of these materials is highly objectionable from both a toxicological and environmental standpoint

Secondary explosives (colloquially known as "secondaries") differ from primaries in that they are much less sensitive to impact, friction, electrostatic discharge, heat, and shock. Instead, they are intended to be initiated by the heat and shockwave generated from a detonating primary explosive charge. There is a tremendous need for the development of secondary explosives that have higher performance, lower sensitivity, and lower toxicity than the currently fielded explosive compounds.

Higher performing secondaries are classified as those having higher detonation velocities, higher detonation pressures, higher crystalline densities, and a higher heat of detonation. Secondary explosives with a higher performance typically correlate to an increase in brisance, which is defined as the fragmentation ability or shattering effect of an explosive charge within a specific vicinity. As a rule of thumb, explosives with higher crystal densities and higher enthalpies of formation directly correlate to higher detonation pressures, detonation velocities, and overall greater energy release.

Key Words*: *Explosives, vicinity, shattering effect, detonation, crystalline electrostatic, friction

1. INTRODUCTION

This project mainly works on study of types of explosives used in mining and it's working parameters and it's condition, applications in the mines of singareni Collories Company limited in kothagudem area. Explosives constitute an important input in the production of coal, minerals, overburden or waste and also for construction/ demolition purposes. It touch the life of every individual in this modern world. Beginning from electricity generation to steel production. Civil construction, levelling of construction & agricultural sites, drivages in rock strata, etc. every where there is these of explosives. The list of its usage is endless so also its development. An explosive (or explosive material) is a reactive substance that contains a great amount of potential energy that can produce an explosion if released suddenly, usually accompanied by the production of light, heat, sound, and pressure. An explosive charge is a measured quantity of explosive material, which may be composed of a single ingredient or a combination of two or more. There are many types of explosive used in both underground & opencast mines. Some of explosives are give high energy during blasting. There are mainly two types of explosives are used they are

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CASE STUDY OF CONTROL BLASTING IN GRANITE MINES

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Abstract - *Mining activity plays a major role for economic development of nation.drilling and blasting are two key operations in mining industry.Execution of these rows activities generates two main problems they are ground vibrations, and flyrocks and also some disturbances to the environment like noise pollution,air pollution soil pollution apart from that there also ground vibrations.Ground vibrations are very difficult to control.In blasting and drilling generally more noise pollution and vibrations will occur.These vibrations are very much dangerous to our intact structures.Even tough mining activity is done far from the resendial areas there are some structures at mine like mine office,workshop,material handeling plant and so on.From these vibrations there will a great threat. These vibrations from blasting may effect on the structures, to reduce these vibrations from blasting we implemented and used a techniques called control blasting techniques in mines. They are very much attentive and useful to control ground vibrations from blasting and fly rocks. Control blasting techniques are used both in opencast and underground mines also. Due to the severity and impact of ground vibrations the techniques are implemented. This techniques are very useful to control various hazards like noise pollution and ground vibrations and fly rocks.*

Key Words: **Control blasting , ground vibrations , fly rock**

1.INTRODUCTION

Granite in a common type of igneous intrusive rock which in granular and phaneritic in texture. It can be Predominantly white, pink (or) gray in color depending on their mineralogy.

The word comes from Latin word granum, a grain in reference to coarse grained structure such as holocrystalline rock. It in a Igneous rock with 20%-60% quartz by volume and at least 35% of feldspar. Composition of Granite consists of potassium feldspar , quartz and biotite and amphibole the average density of granite is between 2.65 to 2.75 g/cm3.Its compressive strength lies above 200mpa meeting point is1215-1260c

Controlled blasting methods are used to control blast induced effects such as, over-break, fractures within remaining rock walls and ground vibrations etc. In both the mining and construction industries, blasting is the predominant method for fragmentation of consolidated mineral deposits. Adopting various techniques of controlled blasting such as line drilling, trim (cushion) blasting, smooth (contour or perimeter) blasting, pre-splitting etc,; selecting and employing various parameters of blast design; using modern technology such as precise timing delays, varied density of explosives product by using bulk explosives; muffle blasting ata very critical and congested areas are some of the points discussed in this paper for mitigation of adverse impact of blasting. By adopting these precautions not only the ground vibration is restricted to ease the public relation problem, but the mines'/constitution's techno-economics, preservation of host rock strength and safety standard are improved to a considerable level.

1.1Objectives

The main purpose of using control blasting techniques is to reduce ground vibrations and fly rocks while blasting and drilling. This techniques helps the miners to get better output with less risk and also for the reduction of risk from workers.

To maintain this technique the following objectives are to be followed

1. To study about control blasting in Granite mines and Granite case study.

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OPTIMUM UTILIZATION OF WASTE PRODUCED IN GARANTIE MINES

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Abstract – The investigations presented in this project, primarily, pertain to utilization of solid waste produced in granite mines. The present work was done in BVL ROCKS & MINERALS, MALLAYAPALEM (POST) 523274, Praksam (Dt), AP, India.

Marble and granite industry has grown significantly in the last decades with the privatization trend in the early 1990s, and the flourishing construction industry. Stone waste is generally a highly polluting waste due to both its highly alkaline nature, and its manufacturing and processing techniques, which impose a health threat to the surroundings. The general methods of operation implemented in Granites industry are Crushing, Polishing, Re-cycling of Solid Waste. In this project only utilization of solid waste produced in granite mines were studied. It was observed that the waste obtained is used in construction works, road laying works, asphalt-based road surface paving. The dust waste obtained during processing is used as bi-product in manufacturing cement bricks. The important issues on disposal of solid wastes from mines are to choose the right varieties for the comprehensive utilization of mining waste and to control contamination from waste rocks and tailings. Environment- friendly disposal of solid wastes from mines is the key pathway and some comprehensive utilization methods and proposes new ideas on the disposal and comprehensive utilization of solid waste from mines, Solid waste management is aimed to extract the maximum practical benefits from waste products and to generate the minimum amount of waste to comply with Environmental legislation and regulations and the economics of disposal in the present scenario. The objective of this paper is to utilize marble and granite waste of different sizes in the manufacturing and to achieve this goal and for maintaining a sustainable development in solid waste management.

Key Words:: POLISHING, RECYCLING, CRUSHING, PROCESSING TECHNIQUES, POLLUTION

1. INTRODUCTION

Any materials which are thrown away because of no value are called solid waste. Most of the solid waste is disposed in India by land filling and this is most common and important mode of disposal. Solid waste is defined as the material arising from human and animal activities and is being discarded as useless stuff. The processing involves mainly reuse, recycling or disposal. There are many kinds of solid waste like municipal, industrial, agricultural, industrial hazardous and biochemical waste. The specific challenges for waste management for municipal and industrial wastes are both similar, and yet uniquely different. Compositions of wastes within each category vary enormously, but as a general rule, industrial waste streams contain a wider variety and more concentrated forms of hazardous minerals and therefore require special technologies and handling procedures. Disposal and treatment technologies require major long term investments in capital equipment and have ongoing costs. But in addition, the waste and pollution that are treated and disposed off still persist, posing continuous and future threats to the public and environment.

Solid wastes are today one of the worst problems in the world, mainly because of the increase in volume and the high capacity of environmental contamination. The aim of this work is to use the over burden waste and processing waste in preparation of granite chips which are obtained by crushing the obtained waste rock by using crushers. Those obtained chips are used in construction works, road works and molding works.

Waste is obtained in two ways

a) Over burden waste

b) Processing waste

1.1 SCENARIO OF MINING INDUSTRY:

Mining is a major industrial activity that is conducted in locations throughout the world. It involves a full "life cycle" of industrial activities, all conducted in accordance with a range of engineering, legal, regulatory, economic, social, scientific and environmental protocols and practices. Mining activities date back to 2600 B C with the Egyptian expedition in the Sinai Peninsula. Mining operations occur in every continent except Antarctica. They occur within virtually all of the world's major biomes, across a broad range of environmental conditions, from the Arctic, to the deserts and rain forests of the tropical belt.

Mines are also widely distributed across a wide range of geologic conditions and surface relief. They are often located in mountainous and difficult terrains, where they may be subject to a variety of geologic hazards such as earthquakes, avalanches and landslides.

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CASE STUDY ON DRAGLINE

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Abstract - *Draglines have been explicitly used in coal mining for a no.of decades, either as stripper or stripper and coal extractor. As this equipment retains certain intrinsic benefits, which their rivals do not have, they should essentially be operated in round-the-clock fashion for high productivity and low expenditures. In India, the advancement of giant surface mining projects like Bina and Jayanth with setting up of high coal production targets (up to 10MT/year) demands for systems to remove huge volume of overburden in minimum possible time. This has led to major changes in overburden excavation technology in surface coal mining from shovel mining to dragline mining. Coal India Limited (CIL), now has standardized the draglines in two sizes, namely 10/70 and 24/96 for their mines. Most mines depend on the dragline 24 hours/day, 7 days/week. In many of coal mines, it's the only primary stripping tool and the mine's yield is totally dependent on the dragline's performance. For these reasons, only dragline design requires a greater attention placed on developing components with higher levels of reliability and predictability so that repairs and replacement of components can be programmed at times that will minimum affect the overall mining operation. Prior to installing draglines in mines, various aspects have to be taken into consideration for selecting suitable size. The dragline is a Heavy Earth Moving Machine (HEMM), working and operating procedures have been discussed*

***KeyWords*: DRAGLINE, MINIMUM, MINES, INSTALLATION, MACHINARY.**

1.INTRODUCTION

Dragline used in surface mining is heavy equipment. They are mostly built on-site for strip mining operations to remove overburden and coal and they are largest mobile land machine ever built. It consists of large bucket which is suspended from a boom with wire ropes. The bucket is maneuvered by means of ropes and chains. The hoist rope is powered by electric motors and drag rope is used to draw bucket assembly horizontally.

Maximum speed is only few meters per minute. For larger distances disassembly is generally required. Mining draglines are not moved frequently as their reach can work a large area from one position. A dragline is most efficient for excavating material below the level of their base. It can dig above itself also but inefficiently. It is not suitable to load piled up material as a shovel. Draglines are popular with many mines due to their reliability and extreme low waste removal cost.

However, they have very limited application due to their boom height, boom length and dig-depth. Nowadays keeping in view of the demand of increasing productivity draglines having longer booms and large bucket capacity are being selected. However to obtain low cost per cubic meter it is imperative to operate the dragline in a scientific manner for which constant supervision, good overburden preparation, and preventive maintenance of dragline and selective proper bench height of overburden is very much required. In order to achieve higher coal production targets, it is necessary to remove large volumes of overburden in shortest possible time and therefore it has been found that Draglines are the best suited equipment to perform this type of work.

OVERVIEW OF STRATA MONITORING TECHNIQUES USED IN OPENCAST MINES

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Abstract - *Several monitoring techniques including visual inspection, Lidar scanning, total stations, global positioning systems (GPS) to the state-of-the- art slope stability radar scanning and micro seismic monitoring are now used several mine producing countries of mine. The mineral extraction changes the stress state within the slope, making it more prone to deformation over time. This could eventually lead to the slope collapse owning movements environments making it difficult to anticipate slope failure and deformation rate. Surface mining's economics rely heavily on slope angles. Nowadays, technical advancements have made it possible to utilize this technique on a regular basis, resulting in three-dimensional quantitative information about the state of slope stability. The results of a simple numerical model of an open pit slope are addressed in light of the fact that recorded seismic events can be located hundreds of meters beyond the slope surface. Within the slope, seismic movements of recognized geological formations can be monitored and potentially utilized to assess relative stability trends. Micro seismic data should be able to reveal previously unknown structures, which can then be validated using other geotechnical techniques. The project shows that carefully analyzed data from open pit slopes can be used to gain greater insight into the effects of mining can result in more accurate assessments of slope stability.*

Keywords: *Opencast mines, slope, stability, monitoring*

1. INTRODUCTION

Mining is the process of extracting economically valuable minerals from the earth's crust for the benefit of humanity. In India, mining is a significant industry. India is a major exporter of iron ore, chromite, bauxite, mica, manganese, granite, coal, and other minerals. It ranks 6th in term of mineral production volume among mineral producing countries. The mining industry accounts for roughly 2.4 % of India's GDP, (Deshmukh, 2000).

Open cast mining or quarrying of minerals is easier than mining by underground methods. During quarrying, the alluvium and rocks beneath which the minerals are found are removed and placed in an area that will not be needed for quarrying, residential, or other purposes in the future.

A slope failure is a phenomenon that a slope collapses abruptly due to weakened self retainability of the earth under the influence of a rainfall or an earthquake, Because of sudden collapse of the slope.

The study of tracking ground movements and detecting instability before failure is known as slope stability monitoring. Monitoring is a crucial tool for evaluating design performance and failure risk, as well as reducing risk. In the risk management of large open pit slopes, slope monitoring plays a significant role. These monitoring techniques include Robotic Total Station, Lidar scanning, Global Positioning System (GPS), Slope Stability Mining Radar, Time Domain Reflectometry, Digital Photogrammetry, High Resolution Micro Seismic Monitoring, these techniques are used in several countries to monitor the slope stability. In India, open cast mines are now proposed to enormous depths, frequently exceeding the industry's operational experience and knowledge base. In the near future, new geotechnical difficulties induced by substantial in-situ stress are expected to emerge in deep open cast mines. Because of these concerns, appropriate geotechnical engineering practices must be used to mine design and general operating procedures, for safe and economic mining.

The current understanding of geotechnical conditions, slope collapse processes, and slope stability analysis applications is limited. Slope failures continue to occur, resulting in human and financial losses for any business. This project gives an insight into the recent and emerging technologies for open pit slope monitoring.

2. STARATA MONITORING TECHNIQUES USED IN OPENPIT MINES

There are various slope monitoring techniques that can be used in opencast mines. But different monitoring instruments have their own advantage and disadvantages. The pros and cons of the various techniques are presented in Table 1. The comparison of different techniques is shown in Table 2 (Lynch et al., 2005; Sakurai and Shimizu, 2006; Wesseloo and Sweby, 2008; Kumar and Villuri, 2015).

Table 1. Advantages and disadvantages of various slope monitoring techniques

S.NO	TECHNIQUES	ADVANTAGES	DISADVANTAGES
1	ROBOTIC TOTAL STATION	• The range is better than all other techniques The major advantages in prism monitoring are increased precision of the coordinates, continuous measurement in all weather conditions, and accurate measurement	• The disadvantages of prism monitoring are it requires an open sky view or the system will be affected by insufficient tracked satellites. The system can be affected by nearby machinery that affects the functioning of the system,

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Application of Failure Mode and Effect Analysis for dumper in Opencast Mines

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Abstract: *Excavation of minerals are required for the development of any nation. With the increase in demand for the excavation of mineral, mechanization in the mines, especially in the opencast mines has increased exponentially. The main recurring accidents in opencast mines are associated with dumpers. Dumpers are used to carry ore and waste in open pit mines. Failures of dumper have an impact on mine production and can lead to accident. In this paper the risks associated with dumpers operations using Failure Mode and Effect Analysis (FMEA) were examined. The aim of FMEA is to determine the failure effects of different failure modes.*

Keywords: Opencast mining, Risk Assessment, FMEA, Dumpers

Introduction

Open pit mining, as one of the two ways of production in the mining industry, appears to have a more stable working environment, but it also has its own set of risks. Slopes, water income, equipment, falls, hand tools, and dust are all dangers that must be considered in this manufacturing technique. Due to variations in working circumstances across diverse occupational groups in open-pit mining, there is a wide variety of chances for experiencing dangerous situations.

Risk Assessment is a process of identifying the hazards and providing the control measures to minimize the risk. It is a detailed examination of your workplace to discover those items, circumstances, procedures, and other factors that might damage people or property. After the identification was made, there is a need to examine and assess how likely and serious the danger is. After reaching the conclusion, a decision has to be made on what steps should be taken to remove or control the harm successfully.

For doing risk assessment there are mainly three types. 1) Qualitative Method 2) Quantitative Method 3) Semi Quantitative Method. Qualitative risk assessment approaches are quick and simple to apply since broad implications and likelihoods may be recognised, and they can offer a general knowledge of comparative risk between risk events using the risk matrix (ratings). Quantitative risk techniques, on the other hand, are frequently not intuitive and need some upfront understanding by decision-makers. To address some of the limitations associated with qualitative techniques, semi-quantitative approaches to risk assessment are now frequently employed. Qualitative risk assessments produce a more detailed prioritised ranking of risks, whereas semi-quantitative risk assessments produce a more detailed prioritised ranking of hazards. Semi-quantitative risk assessment goes one step farther than qualitative risk assessment by assigning values or multipliers to the likelihood and outcome groups. Multiplication of frequency levels with a numerical rating of consequence may be used in semi-quantitative risk assessment approaches. There are several scale combinations that can be used.

Exact hazard identification and risk assessment are the most important factors for mitigating the risks in the mining sector. The hazard probabilities of opencast mines were determined. In this study FMEA was used to assess the risks associated with dumpers

Methodology

FMEA stands for Failure Mode and Effects Analysis. Improvement teams use the systematic method of an FMEA to identify potential ways for a product or process to fail, describe the consequences, quantify the severity of

OVERVIEW OF BLASTING GALLERY METHOD IN AN INDIAN MINE

- CASE STUDY

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ABSTRACT

In the mining industry, the challenging task of mining professionals comprises the extraction of maximum natural resources along with the protection of the miners. Application of conventional Bord and Pillar mining in thick seams is yielding an extremely low percentage of extraction rate (around 30%) even under favourable conditions. Almost 50% of coal reserves in India are found to possess a seam thickness of about over 4.5 meters which is considered and called thick seams. The exploitation of thick seams by underground methods arises certain difficulties and problems. Blasting Gallery (BG) method can be applied for extracting thick seams. A comprehensive study of the blasting gallery method of mining within the technical and technological analysis is will allow for its effective application.

Keyword; Mine, Blasting gallery method, Thick seam

1.INTRODUCTION

Coal is one of the significant regular assets to satisfy the developing energy needs in India because of its demonstrated geographical hold. The common method employed for extraction of coal in Indian mining industry is Bord and Pillar (B&P) method. The main disadvantages of B&P mining method are that coal has to be left in situ to support the roof strata, and that the labour productivity is relatively low when compared with opencast and longwall mining systems (Wagner, 1980). The productivity and the amount of coal to be left out as pillar depends on the mining depth. Based on the depth the extraction rate can vary. One other disadvantage of the B&P mining method is that it is not suitable for thick seams.

Extraction of thick coal seams using conventional methods, only 30-40% extraction is possible. Carbonnage de France International year (CDFI) have come out with the technology of "Blasting gallery (BG) method", by this method about 80% of coal can be extracted for thick seams. This method is first introduced in East Katras & Chora Mines in India. The concept of mining of thick seams by BG method was developed in the Aquitaine Coal Fields, France (1979)

BG method is challenging technology for mining engineer, this is the only method in which we can extract high 85% of coal in thick seams. In this article, an overview of the BG method is presented with the help of a case study mine.

2. OVERVIEW OF BG METHOD

The method is already introduced in Mine -A in Jharia Coalfield, India, in a 7.5m thick seam dipping around 1 in 8 which was developed in long back in 2 section--one along the floor (2.83m) and another along the roof (2.11m) in the bord and pillar pattern (size of the pillars 23m x 23m centre to centre) (Samanta, 1997). In this method all the pillars (3 pillars along dip-rise) are divided into two halves by 4.2m wide, 3m high (by roof heightening) level splits. Then full thickness of coal in successive slabs is taken by retreating on level galleries from rise to dip and loading the blasted coal from these levels. From level galleries/splits ring pattern long holes are drilled as shown in Figure 1 and blasted from bottom section and the blasted coal from (Sawmliana, 2005). Goaf is loaded through level galleries/splits on the bottom section by means of remote controlled Load Haul Dumpers (LHD) with a bucket capacity of 3 m^3. In turn LHD discharges coal on to armoured chain conveyor for onward transport of coal at the outbye by other means. Jumbo drills are used which drill 3 to 6 rings of holes/day/jumbo with an average number and length of holes 12 to 20 numbers and 5m respectively. Cogs are erected in the top galleries at the intervals of 3m and steel girders (200mm x 100mm) with 2 rows of 40 tonne open circuit hydraulic props are erected in the bottom galleries. Distance between two props is 0.7m. Special type of cartridge-GE-8 explosive (quantity of explosive/ring--16 to 30 kg) and spacer with fuse cord (special type ring cord) are used which produce coal/ring (for a burden of 1.4 m) 125 tonne. Maximum charge per hole is 2 kg and the powder factor achieved 3.9 to 6.29 tonne/kg. Out of 125 tonne of coal produced per blast, 100 tonne of coal is loaded by the LHD whereas remaining 25 tonne of coal is left in the goaf.

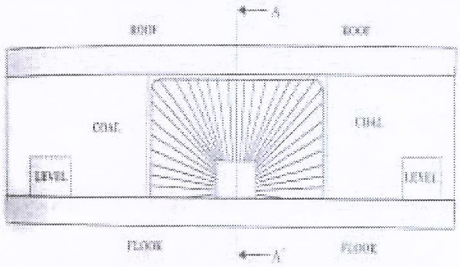

Figure 1. Ring drilling pattern

Result and Discussion

Single lift mining is generally limited to heights of 4.8m. However, thick seams are normally mined multi-slices. This is called slice mining, wherein each slice is mined in one pass. Working of each of slice can be either by bord and pillar method or by longwall method. In general, bord and pillar method poses

MONITORING OF GROUND VIBRATION AT A STONE QUARRY

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Abstract – *The ground vibration is one of the major problem in open pit mines and often it causes severe damages to building and sensitive structures. Release of energy during blasting produces reactive forces, which causes the damage to the near civil structures and sensitive structures. This paper mainly deals with monitoring of blast induced ground vibrations at Stone quarry in North Kerala region in India. The monitoring of ground vibration will helps in calculating the safe charge of explosive to be used. The maximum charge of explosive (MCD) and peak particle velocity (PPV) were recorded for 8 blast events at various distances. Minimate is used in order to measure the vibration levels. All the vibration reading were obtained from varying distances from blast location.*

***Key Words*: Open cast mining, ground vibration, blasting, Minimate**

1.INTRODUCTION

Quarries are used to extract bedrock from the earth in order to generate aggregate materials for the construction industry. The blasting of the rock is the initial stage in this procedure. To shatter and displace the rock, explosive charges are put in holes drilled into the boulder and detonated. Mining, road construction, utility installations, and even residential basement excavations employ this technology. The fragmented rock can be readily handled, transported, and processed to generate the range of aggregate materials required by the building industry once it has been split apart by explosive pressures. Controlling impacts is done using a variety of approaches that are widely utilised in the business. Blasts are monitored and carried out in accordance with blast design studies to ensure that vibration and noise levels are within the damage threshold limit standards. The most common method for fragmenting cemented mineral deposits and rocks is blasting. Blasting is used mostly in open pit mining operations to break up the rock. This procedure, which involves the use of explosives to shatter rock, is sometimes referred to as both a science and an art. Drilling and blasting for hard rock excavation produces noise pollution, fly rocks, and ground vibrations that can harm adjacent inhabitants and sensitive buildings. There are several hazards involved with blasting operations, which might lead to overly cautious design assumptions and excessive expenses. Underestimating ground vibration hazards, on the other hand, might result in unanticipated structure damage, public complaints, and additional expenditures and delays. Cost-effectiveness may be improved without causing unmanageable issues by implementing a planned risk management strategy. Previous attempts by various researches for monitoring ground vibrations can be found in different literature. In this study ground vibrations were monitored in a stone quarry in India.

2. Blast monitoring

With the aid of Instantel's Minimate Blaster, ground vibration monitoring is carried out. The monitor has an inbuilt LCD and an eight-key tactile keypad, as well as a neatly designed, menu-driven interface. Figure 1 depicts the placement of a Minimate in the mine. The PPV collected from different locations were presented in Table 1.

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A STUDY ON VARIOUS SURFACE BLAST INITIATION SYSTEMS

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Abstract - *Initiators are indispensable in blasting system as without these, explosives cannot initiate. There is an important evolution in initiation systems that is electronic detonators, it took two decades to invent the electronic initiation system but it provides greater safety and security even if it is expensive. The concept of electronic initiation system is presenting itself as a challenge to traditional initiation systems. Precision of electronic detonators are more compare to the pyrotechnic detonators. Electronic initiation system prevents ensuing dilemma in inter hole blasting or row-to-row blasting of blasting pattern. The accuracy of delay timings in between the hole to hole or row to row delays are revolutionized by the electronic initiation systems. There are more benefits by using Electronic Delay Detonators such as improvement in fragmentation of rocks, reduction of ground vibration, reduction of air over pressure and back break. The wireless initiation systems are new technologies in mining industries, constructional and underground tunnels. The wireless initiating system includes the software and hardware of the underground and surface initiation control unit and for initiation control process. The wireless communication encrypted with in the control unit to initiation system. The remote wireless initiation system developed network security technology. In the present study it was observed that electronic detonators having more benefits compare to the conventional detonators.*

Key Words*: *Electronic detonator; Pyrotechnic detonator; Precision blasting; Timing accuracy; Wireless initiating system.

INTRODUCTION

Mining industry is the backbone for the development of any nation. Mineral resources can be extracted by two methods namely underground mining and surface mining. In both the case extraction of mineral is done by loosening the material. Surface mining is the most popular method of ore excavation worldwide. Drilling and blasting are the major operations involved in the ore extraction process. Drilling is the process of making a hole into a hard surface and Blasting is the process of loosening and reducing the size solid body with the help explosives. Blasting is the most energy efficient stage in the comminution system and in mining the basic aim is to achieve maximum extraction of minerals keeping in view the environmental, economic and lease constraints. Conventional blasting operations includes drilling holes, placing a charge and detonator in each hole detonating the charge, and clearing away the broken material. In the blasting operations initiation system plays an important role to do effective blasting. Initiation systems require initial energy source, distribution network to deliver the energy to each blast hole and in-hole component to initiate a detonator-sensitive explosive. Detonators are initiators without which blasting cannot commence as hot spots required firing an explosive charge are created by these devices. Detonators are one of the critical components in the complex blasting systems that provide a delay mechanism between holes and rows in a single blast. As a general rule, before you choose an initiation system, you should familiarize yourself with numerous site-specific factors like controlled and uncontrolled parameters of blasting. In this paper an attempt has been made to study different initiation systems used in surface mines, this study will help in designing the appropriate blasting scheme for the particular blast.

DIFFERENT TYPE OF INITIATION SYSTEMS

Detonator: A detonator is a small copper or aluminum tube containing essentially a small auxiliary charge of special explosive.
Ordinary electric detonator: Ordinary electric detonators are of instantaneous, i.e., without any delay element. These are fired by passage of electric current through the detonator.
Electric detonator: A device containing primary explosive that is used for initiating detonation in another explosives material and uses direct electrical energy from the device's leads.
Delay detonator: it is an electric detonator with a delay element.
Nonel: Nonel is a shock tube detonator designed to initiate explosives.
Electronic detonator: a tool containing primary explosive that's used for initiating detonation in another explosives material and utilizes a computer circuit and/or micro processing technology.

An initiation system provides the initial energy required to detonate an explosive used for rock blasting. Initiation systems require:

- An initial energy sources.
- A distribution network to deliver the energy to each blast hole.
- An in-hole component to initiate a detonator-sensitive explosive.

A STUDY ON BLAST INDUCED AIR OVERPRESSURE

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Abstract: Blasting is the important operation in extraction of mineral from the earth's crust. Blasting operations involves drilling the holes, charging the explosives, stemming with the incombustible material and blasting the holes, here blast waves break the huge size rocks to fragments and make easier to collect the broken material and send for beneficiation of ore, alone with the breakage of rock blasting, it also associated with the unavoidable outcomes like ground vibrations, air over pressure, fly rocks, toxic dust etc. Among all air overpressure has more severity on environment, In this paper an analysis has been done on blast induced air over pressure and result shown that scaled distance is inversely proportion to air over pressure, high air over pressure will archived when there is a low scaled distance and vice versa and also it is found that there is a difference between predicted value and actual value of blast induced air over pressure.

Index Terms – **Drilling, Blasting, Explosives, Blast induced Air overpressure.**

I. INTRODUCTION

The mother earth is with full of natural resources, the resources need to be utilized in an optimum manner. For the betterment of live hoods, good infrastructure is needed. Almost all industries directly or indirectly depend on mining industry. Mining industry is considered as back bone for the development of the Nation. In India mining industry contributes 2.2% to 2.5. Mining is the process of extraction of minerals from the earth crust in a safe and economical manner. Mining activity is carried out in various stages namely prospecting, exploration, development, exploitation and reclamation. Mining is carried in two ways, surface mining and subsurface mining. Surface mining means extracting the outcrop minerals, which is in the shallow depths. The surface mining operation is followed by four sequences of operations drilling, blasting, loading and transportation. Drilling and blasting are the two important operations in mining industry. Drilling is the process of making holes into the face or ore body in specific pattern by considering the nature of orebody. Blasting is the process of breaking the huge hard mass into fragments with the help of explosives. However, blasting operations not only gives fragmented rocks, but it also gives some negative outcomes like fly rocks, ground vibrations, toxic dust, air over pressure etc. Among all Ground vibrations and air over pressure have major impact on the environment. Air over pressure has a high potentiality to cause major damage to the environment.

The Blast Induced Air Over Pressure mainly affected by controlled and uncontrolled blasting parameters. burden, spacing, type of explosive and delay sequence are the controlled blast parameters and the strength of the rock the density of the rock and rock type are the uncontrolled parameters. The uncontrolled parameters are mainly affected by the physical and mechanical properties of rock, whereas the controlled parameters are affected by the blasting operation. In this study the Blast Induced Air Over Pressure was monitored at various blasting sites and the observed reading are compared with USBM predicting equation.

METHODOLOGY

Three different datasets of various Blast Induced Air Over Pressure were collected from various researchers by carrying some literature reviews on various blasting related published research articles. Drilling and blasting are the most popular techniques used for extraction of ore. Generally rotary, percussive and rotary percussive are the three methods used in drilling. Prior to drilling marking of holes in a specific pattern is followed, then drilling of holes is made by deploying machinery like down the hole in opencast mines. After the drilling of the holes, holes are charged with various types of explosives depending upon the nature of rock and another factors. High density of explosives is generally used for hard rocks and low density of explosives are generally used for soft rocks. Explosives are charged with detonator for low explosives and high explosives are charged with boosters due to the sensitive characteristic property. These charged explosives are tightly packed along with incombustible material, this process is called as stemming. After this, the charged holes are connected in series or in parallel or in combination of both series and parallel, the end is connected to exploder and with help of the exploder charged holes are blasted. Blasting process not only break the huge hard rock into small fragments but also negative outcomes like fly rocks, ground vibrations, toxic dust, air over pressure etc. which may lead to damage of structures, machineries, and loss of property and life. However, it is not possible to eliminate this negative impact completely but, with the help proper methodologies these negatives impacts are reduced and prevent loss of life and property.

Generally, the drilling is practiced in three methods, percussive drilling method is process of impact hitting the number of strokes on the surface to make the hole, but it is applicable to few meters in the earth's crust. Rotary drilling method is process of making the hole in the earth's crust by rotating action on the surface. Rotary-percussive is the combination of both rotary and percussive, this method is advance of both methods. Depending upon the geological characteristic of rock and availability of drilling machinery, according to that drilling method is adopt in the mines. After drilling the holes in a specific pattern, explosives are charged with boosters or detonators depending upon the sensitivity of explosive, direct or indirect initiations system is followed for blasting the charged holes. During the blasting operation the Blast Induced Air Over Pressure was monitored with the help of a special equipment called minimate, this instrument mainly consists of two major components namely Geophone and Microphone. The Geophones connected to micromate measures ground vibration in three directions vertical, transverse and longitudinal. These

A STUDY ON HYDRAULIC STOWING

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Abstract – Mining is the process of extract the ore\minerals from the ore\mineral deposits. Mining operation can done in two ways either opencast or underground process. In underground mining the extracted areas are to be back filled with incombustible materials like sand or fly ash for ensuring the safe conditions of mined area. The process of back filling the mined out aera with different filling materials is known as stowing. Stowing is practiced in depillaring stage to fill the voids with incombustible material formed during extraction of pillars. Stowing process is essential for underground working areas to avoid the subsidence, roof collapsing. In mines the stowing method can be carried out with different methods. Generally hydraulic stowing practice is widely used. In this paper an extensive study was carried on various hydraulic stowing methods and result shown that the use of pond ash as stowing material is having more benefits when compared to other materials.

Index Terms **- Underground mining, Hydraulic stowing, Sand, Pond ash , Overburden.**

I. INTRODUCTION

When mineral is extracted from an underground mine the void or goaf is packed with sand or other packing material wherever it is conveniently and cheaply available in sufficient quantities. The process is known as "**goaf stowing**" or "**goaf packing**" and often simply as "stowing". The material employed for goaf packing may be stone or shale obtained from bands of stone or sand if they are present in the coal seam under extraction. They may be used for erecting pack walls or for stowing in the mined out goaf, in the crushed form. Other material which is sent down the mine for goaf stowing may be sand, earth, boiler ash, crushed material available from quarry overburden, shale pickings at the screening plant, washery refuse, mill tailings, or slag from blast furnace for iron ore smelting.

Types of stowing

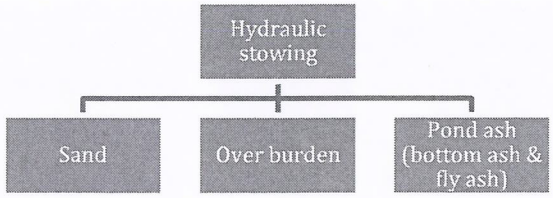
1) Dumping it with baskets with the help of human labour as in "**Hand packing**".
2) Transporting the material with water in pipes and allowing the water to percolate through bamboo matting or similar perforated barricade erected at site. This process is known as "**Hydraulic stowing**".
3) Throwing it with the help of a high-speed belt conveyor as in "**Mechanical stowing**".
4) Introducing the material in a stream of compressed air as in "**Pneumatic stowing**". Sand packing is adopted to stabilize and workings where pillars and galleries are high. It is adapted sometimes to from a barrier underground against fire area.

Surface manifestation of underground coal extraction occurs in two forms, pothole and trough subsidence. Pothole subsidence is a sudden depression of ground surface of small area due to sudden collapse of overburden into the underground void. Trough subsidence is a large area depression of the surface terrain, which is common at greater depth. Pothole subsidence is hazardous to life, as it does not impart any prior indication before its occurrence. Ground movements produce various forms of damage to different surface features and structures. Stowing in underground mine ensures the safety and productivity of the mine, as enumerated below;

High percentage of extraction is attained and therefore wastage of coal underground is reduced. Extraction of thick seams, a seam below fire area, water bearing strata and below railways, national highways, towns, etc, can only be extracted with stowing.

II. METHDOLOGY

Mostly hydraulic stowing done with sand used in underground mines. Due to insufficient of sand material it can replaced by over burden or pond ash (fly ash & bottom ash) or any other incombustible material.



Flow chart 1: Hydraulic stowing with different filling material

2.1 Hydraulic stowing with sand; Hydraulic sand stowing is most popular method used in underground mines. The process of back filling in mined out area with sand material is known as sand stowing. The sand is transported to site by trucks aerial ropeways, and dredgers discharging sand into bunkers.

Specific gravity of sand – 2.65

Table 1: Concentration of sand and water as follows

Sand	Water(by vol)
1	1.5
1	2

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Human Factors Analyzing By Using Swiss Cheese Model

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ABSTRACT

Mining is the most dangerous profession in the world. There are different ways of causing accidents in mines. Mine accidents are unplanned and unexpected. The accident analysis and literature studies indicate that most of the accidents happening in mining industry are due to human errors. So, there is a need to minimize human errors. In this paper, human factors are analyzed to understand the causes of accident by using Swiss Cheese Model. The study is performed with the help of questionnaire survey. According to the survey the prime factors are considered as management, supervisor, and workers.And the drawbacks of these factors are analyzed by the Swiss cheese model. And favorable options are added to decrease the cause of the accident.

KEYWORDS: Swiss cheese, management, supervisor, workers, accidents

1. INTRODUCTION

Mining is the most dangerous professions in the world. Unsafe conditions in mines result in a range of accidents resulting in death and injury, property damage, production stoppages. It is a dangerous profession associated with a high rate of accidents and injuries. Understanding the causality of accidents is an important step in reducing accidents. Accident modeling techniques provide the necessary platform for interpreting and understanding workplace accidents.

The Swiss cheese model of accident causation is used worldwide in industries. The Swiss cheese model of accident causation is a model used in risk analysis and risk management including aviation safety, engineering, healthcare, emergency medical services organizations and as the principle behind layered security as used in computer security and defense in depth[2]. It compares human systems to multiple slices of Swiss cheese stacked side-by-side, where the risk of a threat becoming a reality is mitigated by the different layers and types of defenses "layered" one behind the other. Therefore, errors and weaknesses in a defense theoretically do not allow for any risk since there are also other defense measures to prevent a single point of failure. It uses slices of cheese on a diagram to show how accidents can occur unexpectedly when certain events, conditions, or hazards "collision" simultaneously in an unprotected system[4].

Mine accidents are unplanned and unexpected events that disrupt work activities and may or may not result in injury or property damage. Thousands of miners die each year from mining accidents, particularly in underground coal mines, although accidents also occur

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Environmental Impact of Land Degradation due to Mining

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ABSTRACT

The effect of mining on air, water, land, soil quality, vegetation, especially woodland environments, and human wellbeing and home has turned into a main pressing issue. Any disintegration in the climate's physical, compound, or organic quality affects human wellbeing as well as widely varied vegetation. Excavators' medical conditions brought about by on location defilement like residue, gases, clamor, grimy water, thus on.is definitely standing out. A portion of the unfavorable impacts on the scene and human climate might long-endure. While certain components of the minerals business, states, and others are more mindful of these difficulties than others, successful area wide administration of these issues is neither pervasive nor sufficient. The ongoing paper analyzes a few strategies that may be utilized in India to alleviate the adverse consequences of mining ashore.

KEYWORDS: degradation, vegetation, mining activity, ecosystem, habitation.

1. INTRODUCTION

Mining has a long-term impact on the terrain, the eco-system, and socio-cultural-economic factors. It's worth noting that the actual land mass available to humanity accounts for only 30% of the overall world surface area. India's property region is around 2-3% of the world land region, however it supports over 16% of the worldwide populace. This urgent figure exhibits that the poor per capita land holding is 0.32 hectares, featuring the significance of giving close consideration to land rebuilding/recovery subsequent to mining to effectively utilize the land. The area has been determined to be significantly degraded as a result of mining and subsequent activities. The removal of overburden from the mining location causes a major loss of rain forest and richtop soil. Overburden removal is typically accomplished through blasting or the use of excavators, both of which generate a considerable volume of trash (soil, flotsam and jetsam and other material). this is futile to the business, thus it's usually merely piled up in large quantities within the mine lease area, and occasionally on public land. The greater the mine's scale, the greater the amount of waste produced.

As a result, opencast mines pollute the environment more than underground miners since they produce far more trash. Open-pit mines generate eight to ten times the amount of trash as underground miners [1].

1.1. Land degredation

The stripping ratio is the ratio of overburden dug to the amount of mineral extracted. A stripping proportion of 4:1, for instance, implies that 4 tons of waste stone are taken out for each huge load of mineral extricated. The

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Wireless Accident Detection System for Improving Safety on Opencast Mines

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ABSTRACT

Over the years the mining industry is evident for fatal accidents involving workforce and machinery and most of the accidents are due to moving machinery, specifically dumpers/trucks. Keeping given the demand for mobile transportation machinery to ascertain more safety, Early detection of elements involved in an accident can probably reduce the rate of accidents. Accidents occur majorly due to the running of dumpers over the vehicles, workforce around it, and colliding with the parked vehicles, previous research made it clear that it is impossible to avoid accidents associated with dumpers but can mitigate the accidents to a possible extent. One of such important safety features is the accident detection system for mobile vehicles such as dumpers. The wireless accident detection system detects the movement of vehicles and workers approaching them. This system acts as an alerting agent when an operator fails to recognize the things around it, upon the alert an operator can immediately apply brakes or can take necessary actions to prevent the vehicle from being collided with the other objects.This system uses an Arduino-based microcontroller, ultrasonic sensor HC-SR04, and other alerting devices. Contrary to what has been happening regularly, this wireless accident detection system improves safety, reduces the chances of a collision, and reduces the rate of accidents in mines, this system is of low cost and occupies less space compared to the state-of-the-art designed systems

Keywords—dumpers, Arduino, sensor, detection.

1. INTRODUCTION

The mining sector is considered the backbone of all industries since it is the only supplier of raw materials/minerals. No other industry can survive without the mining activities, as the demand for the mineral is increasing every year, so to meet the demand and increase the mining sector's contribution to GDP.In recent years the trend of mining operations has been shifting from underground mining to opencast mining rapidly. This is to reduce the accident rate and to increase the production of the mine. The underground mine environment is composed of poisonous gases, making it a hazardous environment and always involved in roof falls, explosions, and inundations, which will lead to loss of life, as well as machinery. Whereas on the other side opencast mines overcame all the difficulties of the underground mines, also these are free from such accidents and ensure safe working conditions and a high degree of supervision in every mining operation.Dumpers are heavy earthmoving machinery, and the main transportation system in opencast mines, since dumper is an off-highway vehicle it suits the opencast mining conditions and they are considered to be the most reliable machinery among the available transportation systems.Despite many advantages, dumpers are frequently involved in many fatal accidents. In opencast mines, the rate of accidents due to wheeled

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Analysis of Opencast Mining Machinery by Using Failure Mode Effect Analysis Technique

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ABSTRACT

Mining is an industrial activity that extract rock from earth's crust and processes it to attain valuable minerals for human needs to use them, but it is not a simple operation which involves risk in each and every aspect of work. For extraction of minerals in Open cast mines are extensively used. The machinery which used for extraction of mineral in opencast mine is dumpers. Dumper failure can lead to accidents and production loss in mines. In order to reduce those effects, it is necessary to conduct risk analysis to machinery and accompanying elements in the field. In this paper Failure Mode Effect Analysis (FMEA) is used to conduct risk analysis to dumpers. It is a quantitative risk analysis technique to calculate the Risk Priority Number (RPN) value, which gives information about which failure has to be prevented first and preventive measures to reduces the RPN value. Which make aware the company or maintenance in charge to concentrate on the failure which leads to more damage. So that to minimize the failures of machinery in open cast mines.

KEYWORDS: Opencast, Dumpers, FMEA, RPN, Machinery.

1. INTRODUCTION

Mining is the process of extracting the mineral reserves from the earth crust when reserves are proved feasible to extract. In Mining the extraction is done in the orebody, vein, lode, seam. The main purpose of mining is to extract the mineral which are needed for human life and mining is considered to be second most important activity after agriculture. They are various types of mining:

1. Open cast mining.
2. Underground mining.
3 Placer mining.
4. In Situ mining.

Open cast mining is defined as the extraction of minerals from the Quarry in the ground, by removing the overburden is called open cast mining

In the earlier days Conventional mining was practiced to extract the mineral deposit. But the improvement in the mechanization of the mining field with implementation of machinery in open cast mines during the last 50 years was a rapid growth which led to economic development of the country.

The mining machinery which are used in the open cast mining are mainly dumpers, shovels, dragline, bulldozer, road grader, surface miners, bucket wheel excavator, mechanical loaders etc. Each and every machine has its

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A Study on Prediction of Blast Induced Air Overpressure by different Approaches

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ABSTRACT

In this paper, a comparative study on performance of empirical equation, artificialneural network (ANN) and fuzzy logic in prediction of blast induced air overpressure is conducted. For this purpose, a total of 26 blasting data sets for prediction of air overpressure are collected from a limestone mine in India. The monitoring distance and maximum charge/delay is taken as two input variables and the air overpressure (dB) as the output variable. Root mean square error (RMSE) is used as a performance index to measure the performance of the proposed models. The results indicated that ANN is more accurate when compared to fuzzy logic and empirical equations.

KEYWORDS: Artificial neural network, Empirical equation, Fuzzy logic, Air overpressure,Root mean square error.

1. INTRODUCTION

In open-pit mining, there are several methods which are used for fragmentation of the rocks. Among them drilling and blasting is most employed method by considering its technological and productive aspects [1-3]. A large amount of fragments of rocks are produced by the blasting operations which are used for loading and transportation at cheap cost. Around one fourth of the explosive energy is utilised for the rock fragmentation and remaining three fourth energy considered as unwanted environmental effects such as blast induced ground vibrations, fly rock, dust, blast induced air overpressure, etc [5-9]. These environmental issues may affect nearby infrastructure.

Air overpressure is considered as one of the most dangerous among the various side effects in case of causing of damage. During blasting, explosive gases are rapidly released into the atmosphere, in the form of pressure waves. These pressure waves which are greater than the normal atmospheric pressure and known as the blast induced air overpressure. Air overpressure has an impact on structures as well as humans and can cause damage [10-12].

Different types of methods are used in this study to forecast air overpressure values such as empirical equation, artificial neural networks and fuzzy logic models are developed for the prediction of air overpressure.Empirical models struggle to make reliable predictions when the level of air overpressure surpasses specified limitations. As a result, the deployment of an artificial intelligence network is crucial for predicting air overpressure.

Artificial neural networks (ANNs) are a form of artificial intelligence that work similar to human nerve systemsand can guess existing function based on real-world data. The nodes in the ANN models are

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AStudy on Prediction of Blast Induced Ground Vibration by Different Approaches

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ABSTRACT

The main aim of this paper is prediction of blast induced ground vibrations (BIGV) by using both Empirical Equations and Artificial Neural Network (ANN). The ground vibrations are recorded and collected from a mine using a Minimate™device to evalute the most appropriate way to predict BIGV. A total of 26 blast data was collected from mine for prediction of Peak Particle Velocity (PPV). Out of 26 blast data 18 data samples were used for training, 4 data samples were used for validation and 4 data samples were used for testing. Also used for predictionof PPV by using different empirical equations. The performance of different empirical equations and ANN were observed based on Coefficient of Determination (R^2) and Root Mean Square Error (RMSE). At the end of this study, it was observed that the prediction by ANN gives more reliable and accurate results than empirical equation approach. High coefficient of determination value (R^2 = 0.7897) was observed by ANN technique. Also, the RMSE value obtained by ANN was very close to zero. It indicates that the Prediction of BIGV by ANN approach gives the more accuarate results than Empirical Equations.

KEYWORDS: Blasting, Ground Vibrations, Empirical Equations, ANN, Coefficient of determination.

1. INTRODUCTION

Mining is the activity of extracting the economic ore mineral from the earth. Mining industry is the backbone of economic growth of the country. In mining Drilling and Blasting are the main procedurespractised for the fragmentation of rock.These are the conventional methods used for breakage of rock mass and these methods have reasonable advantages in terms of technicalities, cost, efficiency and convenience, when compared to the cutting machines [1-3].

In blasting operation, explosives are used for effective breakage of rock mass. Whenan explosive charge explodes in the blast hole, itreleases a large volumeof hot gases in the form of high temperature and pressure.However only some part of this explosive energyi.e20% to 30% is utilized for the breakage of rock mass while remaining partis wasted and leads to some nettle problems like ground vibrations, air over pressure, noise, fly rock, backbreak & dust [4]. Among all the consequences of blasting, Ground Vibrations creates more nuisance like structural damage. To provide safety for the structures and personnel the blasting consequences should be within the allowable limit and safe thresholds [2]. There are several several factors

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Development of an IoT Based Blast Induced Ground Vibration Monitoring System

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ABSTRACT

Blasting is the cost-effective and quick operation in mining to obtain the rock fragmentation. Usage of explosives in blasting not only fracture and displace the rock butalso have some detrimental consequences on the adjacent structures, which may lead to their demolition. To sense, record, and monitor the ground vibrations, modern technologies like InstantelMinimate plus, Micromate, Blastmate-II are employed. The key drawbacks of this conventional systems are wire-based, expensive, and tedious process. To alleviate these limitations, this research proposed a low-cost IoT based wireless monitoring system for blast induced ground vibrations. The developed prototype uses SW-420 vibration sensor, Arduino based microcontroller and other indicating devices. This paper also focuses on the significance of IoT in the mining sector for optimizing production, profit, and safety.

KEYWORDS:Blasting, Ground Vibration, IoT, WSN,SW-420 Vibration Sensor.

1. INTRODUCTION

Mining plays a vital role in the economic development of any nation. Mining provides employment, generates tax, stabilize the economy, and contribute to the nation's GDP. Mining operations can be carried out in a variety of ways. In the mining sector, the most common rock fragmentation excavation methods are Drilling and Blasting. Blasting is a more cost-effective method of mining rock excavation. However, blasting pose risk to both humans and environment. According to the studies, only 1/4th of the explosive energy is used to fracture and displace the rock mass, while the remainingenergy is lost as ground vibrations, fly rock, noise, backbreak, air over pressure, and other forms of energy loss [1-5].

Ground vibration is a prominent issue among all the negative consequences [1].Ground vibrations are an inherent feature of rock blasting process, and they cannot be avoided but can be minimized to some extent [6]. Vibrations from the blast inflict substantial damage to the nearby structures and buildings as shown in Figure 1. So, it is necessary to sense, record and monitor the ground vibrations to know the permissible limits and ensure safety in mine. To monitor ground vibrations, current technologies such as InstantelMinimate plus, Micromate, Blastmate-II are commonly employed. Existingground vibration monitoring systems rely on wires to collect and transmit data in the field. Furthermore, wire-based prototypes can only be used in a restricted region, and the systems become inoperable if the wires are damaged, which happens frequently. Purchase and repair of existing devices are too expensive. As a result, it is important to develop a low-priced IoT based wireless

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A Clustering Based Analysis to Visualize the Effects of Ground Vibrations in Rock

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ABSTRACT

Ground vibrations are the significant effect caused by drilling and blasting operations. The ground vibrations should be within the permissible limit to avoid structural damage nearby places/surroundings. Engineers and geologists design the blasting parameters according to the site to control the ground vibrations at a minimum level. The monitoring of ground vibrations during blasting is necessary. The ground vibration's peak limit valuesaremeasured in peak particle velocity (PPV), and frequency of waves is also recorded to analyze the movement of the ground. The ground vibration readings of rock are gathered from an Opencast coal mine in BhadradriKothagudem district, Telangana state. The Micromate vibrometer is used to record the ground vibrations in both sites. Micromate vibrometer collects the details of the waves like peak particle velocity (PPV), frequency, trigger source, record duration, etc. It contains the vibrations data in three directions: vertical, longitudinal (radial), and transverse. The waveform analyses and the cluster dendrogram are done by softwareR. The waveform analyses are done using this super graphics software. The results of ground vibration readings are studied in rock by the micromate, software R which is used for the cluster model for the gathered ground vibrations which has collected in the opencast coal mine in manuguru.

KEYWORDS: Ground vibrations,Peak particle velocity,Micromate,Cluster dendrogram,Software-R.

1. INTRODUCTION

Ground vibrationscauses various hazards in open pit mines like instability of benches and slope, impact on underground water and local infra structures. Hence the ground vibrations should be kept as controlled as possible for minimum effects on mine and surrounding infra structure. In this study we findthe behavior andeffects of ground vibrations in mine locations by using clustering technique in software-R, in both coal and rock. The ground vibrations arecaused during drilling and blasting operations. The main cause for ground vibrations is excessive use or over charging of explosive and. It also depends on the type of rock beds present in the mine location.

Blasting operation takes place in both coal and rock excavations widely in mining. Coal excavation is considered productive work, and rock excavation is unproductive to perform in the mining area. The removal of overburden is necessary to access the mineral deposit. The characteristics of both rock and coal are different from each other, like density, strength, blast ability, etc. The blasting performance is planned according to the properties of coal and rock on the site. There are different types of explosives to perform blasting on site. The

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A Case Study on Optimization of Blasting Operationin Opencast Mine

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ABSTRACT

The mining industry is concerned with the extraction of valued minerals from the earth. In any mining developmentdrilling and blasting are the main basic processes that are a part of acombined system and effect the results of next operations in production and expenses. The main objective of fragmentation with explosives is to manage the operation as low cost as possible and at the identical time keep the technical details in accordance with the protection conditions. This process is attained by taking of optimization process. In the present study we tried to identify the optimization of blast design by by means of blasting parameters. This is simple to use because it can compare explosive performance by changing parameters like burden,holewidth, sum of holes alsoquantity of explosives, and therefore make conclusion to settle down on the proper usage of explosives. This proessabsolutelyprovideliberation to mine workers and blastingstaff to knowfor improvedproductionon a lower cost of mining. Sincecurrentopenpits require hugeamounts of explosives during the mine's life, cost of blasting operation can be significantly reduced by reducing the quantity of explosives.

KEYWORDS: Optimization, Drilling, Blasting, Blast model, Explosives.

1. INTRODUCTION

The mining industry plays an important role of economy of that county. In mining the important point is to accomplish the removal of minerals keeping in understand the ecological, monetaryand also rent limitations. By the increase of human progress, the vital of various minerals hasexpanded complex theaccomplish this need.

In mining industry, the mineral resource mined by both opencast and underground mining. In both cases the removal is done by loosening the mineral through mainly accomplish the processes of DRILLING and BLASTING.The opencast working plays a vital rolebecauseof the improved output, regaining and protectionin the mining operation. excavation comprises the removal of leftover rock and subsequent extraction of mineral. If the deposits are underlying hard and waste rock called overburden, the removal of the overburden is very significant before mineral excavation can takes place. Thus, the drilling and blasting is that the important ground preparation job for hard minerals.

The topic is OPTIMIZATION OF BLASTING OPERATION. this subject mainly works on the study and assessment of optimal blast and blasting parameters. In mining industry excavation, the DRILLING AND BLASTING is that the key unit operation. The

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Change Detection of an Open Cast Coal Mine using Spatial analysis and ArcGIS.

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ABSTRACT

Change Detection method identifies the change in any site on the earth with the analysis of past data. The change detection process in coal mines place a major role in finding the illegal mining operations and helps to detect the reclamation area, extended mine area, the total area of the mineral is to be extracted and land cover. This work utilizes the images from USGS to study the change detection phenomenon of a particular mining area. The LISS images hasbeen considered in this study for the optimization of results. The ArcGIS software has been used for the study of mine area. The results obtained from the software provides the optimal analysis in terms of change detection with respect to coal mine.

KEYWORDS: Change Detection, Illegal Mining, Reclamation, USGS, ArcGIS.

1. INTRODUCTION

1.1 REMOTE SENSING

Remote sensing is the most common way of finding and noticing the actual qualities of an area by estimating it's reflected and produced radiation at a far off. Remote sensing is utilized in different fields, including land surveying, topography and most geology disciplines for instance nature, hydrology, meteorology, geography, and oceanography.The Remote sensing process is shown in the figure 1.

Remote sensing is a technique for collecting, transferring, handling, and obtaining of geographic data with-out approaching the surface straight forwardly. Remote sensing innovation has unique qualities, for example, multipoint, multiband and temporal. All the while, remote sensing can gather the data of frequencies which isn't in the noticeable range, which broadens the scope of perception.

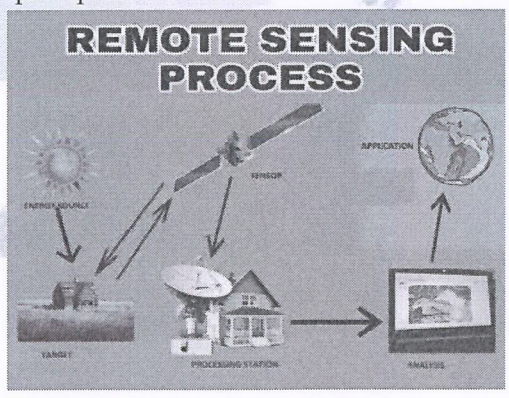

Figure 1: Remote Sensing

1.2 CHANGE DETECTION

Change detection means identifying the change of the object or any site on the earth of a particular period with the analysis of past data. The change detection of coal

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ReliabilityAnalysis of DTH Drill Bits in consideration with Failure Modes

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ABSTRACT

Rock drilling is a common practice in the mining industry. The drilling process with drill bits directly impacts the production rates and shares the economy of the entire mine. A successful drilling operation depends on multiple factors such as operating parameters, type of drill bit, operator skill, and geological conditions. Frequent failure of bits is a severe concern for field engineers and the manufacturing industry. The present study discusses the failure reasons of down-the-hole (DTH) bits in the barytes mine. The life data of the DTH bits have been considered in the study. A reliability-based analysis has been done on bit life data to estimate the bit reliability with respect to different failure modes.

KEYWORDS: DTH bits, Bench heights, Life data, Reliability, bit failure

1. INTRODUCTION

The failure of bits is a severe issue, and its behavior has been discussed in the past. Beste et al. [1] have addressed the behavior of the button bits in different mining conditions. They concluded that the life of a drill bit depends on several factors, including the geological conditions of rock. Beste and Jacobson [2] have studied the microscopic study on button bit using Scanning Electron Microscopy. They proposed the wear and deterioration condition of WC/Co rock drill buttons. Ren et al. [3] have discussed the behavior of rock drill bits in different mining conditions, and they found that the life of drill bits plays an essential role in the drilling method. Liang et al. [4] have discussed the different drill bits available in mine. Their study examined the milled tooth type drill bit thoroughly. DTH, tri-cone, and milled tooth type drill bits are mainly used in mining, and several researchers have studied their constructional features. Prakash and Mukhopadhyay have studied the life of drill bit using reliability analysis by collecting time to failure data from the field [5]. They proposed a new data collection technique and showed warranty-based drill bit data's importance in reliability analysis. Researchers have examined different DTH bits' failure modes byconsidering the wear and microscopic test on failed bits [6]. The DTH drill bit's strength depends on the strength of the inserts. These inserts are embedded on the drill bit surface with shrink fit. The process of manufacturing of these inserts is done with the powder metallurgy technique. Researchers have studied the performance of DTH drill bits by calculating the rate of penetration on overburden. The relation between penetration rate and wear has been examined by Karasawa et al. [7]. The present research discusses the

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Root Cause Analysis of Occurrence of Accident in Indian Underground Mines Using Bayesian Network

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ABSTRACT

The underground mining industry is one of the most hazardous industries since it has high rate of fatal and non-fatal accidents. These accidents often cause loss of life, money, machinery, and time that directly affect the production of the industry. Hence it is necessary to predict these accidents and their root causes to avoid accidents to improve the total safety of the mine using artificial intelligence tools. In this research work, Bayesian Network (BN) model is used to make a causal relationship between the root cause of accidents and their effects and some of the additional parameters that are responsible for the occurrence of an accident in underground mining industries. Whenever any evidence is identifiedthat is directly fed into the BN model and updates the conditional probability table (CPT). After that Bayesian inference is used to identify the most probable root cause along with the probability of the accidents in the mine. The predicting root cause gives them sufficient time to take some necessary action to eliminate the symptoms of the accident and to improve the safety of the mines.

KEYWORDS: Bayesian network, Bayesian inference, Underground mine accident, Root cause analysis, Netica

1. INTRODUCTION

An accident is defined as an unfavourable event that causes a period of disability, interruption of work scheduleor time loss that directly affects the production of the industries. Some the occurrence of accidents can cause loss of life, serious injury, machinery, and money that reduce the safety of the mining [1]. The mining industries are highly unsafe due to the high rate of fatal and non-fatal accidents [2]. In the case of underground mining fatalities rate and the number of accidents increase due to their work environments, improper lighting, toxic gases and geological disturbance [3]. In the Indian underground mining, the number of the person killed and injured from 1960 to 2022 is presented in figure 1. The data have been collected from the ENVIS centre of environmental problems of mining. It is observed that from Figure 1,there are 59 to 112 persons killed every four years and 18 to 53 peoplehave been seriously injured. To increase the safety of the Indian underground, the DGMS issued rules and regulations such as the Coal Mine Regulation 2017, the Mines Rule 1955, and the Mines Act 1952. The underground mining industry employs millions of miners and other workers, it is critical that personnel are kept informed about hazards and that proper precautions are taken to reduce risks.

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Reliability analysis of a Dragline: A Case Study

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ABSTRACT

In the present scenario,the demand of coal growing continuously in the world that needsto deploy highly mechanized earthmoving machinery (HEMM) to meet the demand of the industries.Dragline is a HEMM used in surface mines to remove overburden and dump into the decoaled area.The occurrence of failure of the dragline and its components influences the production of the mines, increasing the maintenance cost, and downtime losses. This research workfocusesto estimate the reliability ofvarious components of the dragline using time to failure (TTF) data of respective failure components. The modelling and analysis of TTF data were done and identify the best-fit distribution by using EASYFIT software. The reliability of the individual component is identified that helps the maintenance engineer to develop the preventive maintenance policy that can improve the dragline productivity by reducing the unexpected breakdown failure. This research will help technicians in identifying the critical components of draglines for better maintenance planning, leading to increased equipment availability, and reduced production losses in the industries.

KEYWORDS: Dragline, Reliability, Time to failure (TTF), Opencast mining

1. INTRODUCTION

Mining industries are focusing to improve the reliability and maintainability of heavy earthmoving machinery (HEMM) to increase their productivity and performance toachieve the annual targets. The HEMM consists of different subsystems/componentsand wheneverafailure occurs in any component thatdirectly affects the reliability and maintainability of the system. Draglines are the heavy earth moving machinery (HEMM) deployed in a large opencast coal mine for overburden removal [1]. Draglines are capital-intensive HEMMs, and hence their failure has a major impact on the productivity of the mine [2,3]. In order to make the dragline available for use and to optimize the operational cost, the reliability analysis of the various components of the dragline is of paramount importance to the maintenance engineers. The maintenance policy of the dragline is categorized into two types: planned maintenance and unplanned maintenance [4]. Planned maintenance includes periodic maintenance of the equipment before its failure [3]; whereas corrective maintenance is performed after the failure of the components or subsystem of the dragline and repair or replacement operations are performed to back into the functional state [4]. The corrective maintenance of the dragline can lead to major downtime losses. The goal of reliability analysis is to examine a statistical approach which fits the information best. The reliability is the operation of time, mean time to failure (MTTF) and mean time to repair (MTTR) data are employed to find the

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A Study on Qualitative Assessment of Water Quality in the Stream and Pond Water near Coal Mining Area.

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ABSTRACT

Mining plays a major role in nation's economical development and simultaneouslycauses several environmental issues. Coal mine regions in India are with great nature of water with only restricted exemptions. There are thirty-six parameters to decide nature of water in a specific water source. In this paper,an endeavorwas made to give the index value of gathered water from a pond and stream located near the mine region. Samples are examined for 11 physical and chemical parameters: Turbidity, Total hardness (TH), Nitrates, Chlorides, Sulfates, TDS, EC, and Biological oxygen demand (BOD).WQI values of water samples tested are 59.92 and 74.74. the results obtained from the analysis will be utilized to determine appropriate treatment methods for involving the water for various purposes.

keywords: Physico-chemical parameters, coal mining, laboratory analysis

1. INTRODUCTION

Water contamination is the major issue in present world that requires intermittent appraisal.Water pollution is an extreme issue in both created and Developing nations that continue to battle this issue. Water is typically alluded to as contaminated when it is debilitated by anthropogenic impurities and either theydoesn't uphold a human use, like drinking water. Mining is one of the significant reasons for contamination. Mining exercises are additionally answerable for Many different portions of climate corruption. Fundamental sources of water contamination from mines are Mine water seepage, spillage of mineral presented water to the water sources close by, acid mine wastewater, and water from ruin stacks. These sources likewise bring about contamination viz. accumulation of heavy metals and sedimentation, leaching, etc.Indeed, tailings from the mineral handling plants influence the surface water and groundwater bodies. For controlling the water contamination, we need to know the circumstances and end results of water contamination. When the Causes are realized appropriate relief measures can be taken to control these variables. Concentrating on the effects of contamination on water quality is additionally vital. We ought to know how the water quality is Affected by this multitude of elements and what it will mean for life and tasks. For that different fundamental physical and chemical parameters are to be determined.Water is a fundamental requirement for the mining operation. All the mining tasks straightforwardly or by implication require water for their activity. Corrosive mine seepage has turned into a typical

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Slope Stability Analysis of Dragline Dump: A Case Study

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ABSTRACT

In the acculturated world mining exercises are inseparable from the norm of life as well as the condition of any country. It brings about both monetary and uneconomic materials being created. The Uneconomic materials (Wastes) are stacked at better places known as waste dumps. The solidness of these dumps has been a main pressing issue throughout the long term. The issue turns out to be progressively troublesome with the decreased accessibility of land regions for unloading. In this project, a sensitivity analysis is carried out for finding out the influence of different parameters on stability of dragline dump. Factor of safety was calculated using phase² software and sensitivity indexes of different parameters were carefully calculated

KEYWORDS: dragline dump, slopestability, sensitivity,Factor of safety

1. INTRODUCTION

Power consumptionin modern world miningIt has turned into a fundamental represent the creation of economic minerals. At the production process largenumber of wastes isproduced. Those waste materials are put away in a helpful spot for its further use or removal, or are put away forever. They are put away as an incline or dike. In both of the reasons the dependability of slope has been a main issue. The dependability of slanted land regions, avalanche, is a fundamental concern where movements of existing or planned slopes may have a effect on the safety of people andproperty.The debacles and obliteration incorporate the regular occasions (heavy rains), uncased excavations, road embankments and landfills. Thecited peculiarities happen because of either a mistaken way to deal with the appraisal of their steadiness, or missteps made at the phase of geotechnical examinations, mistaken suppositions made in the stage completing computation, or an unpredictable area of machines on the incline overcharge.

One of the reasons for the wrong appraisal of incline soundness might be incorrect assurance of the topographical design of the slant being referred to. As the mine stretches out to throughout some undefined time frame, these waste dumps and the issues in regards to their soundness issues different methodologies have been embraced and reated throughout the long term. The methodologies is more for computational instead of the manual. Numerous virtual products are available to break down the slants that are responsible to disappointment by the computing the element of wellbeing. In this task phase² programming is utilized to ascertain the element of security and analyze the stability

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Interpretation of Air Pollution by Air Quality Index in Mining Area-A Case Study

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ABSTRACT

The mining industry directly and indirectly supports our everyday life. Mining industry is the most vital industry to meet the people's regular needs and also for country's wealth. On the other hand, mining activities leads to various environmental pollution issues. These pollutions may include air, water, land and noise etc. The air pollutants such as particulate matter ($PM_{2.5}$ and PM_{10}) and gaseous emissions (CO_2, CO, NO_x, SO_2) are released during various mining operations. Therefore, air quality is the major concern in mining regions. Hence it is very essential to monitor these pollutants regularly. Identification of the major pollutant which is responsible for the lower air quality is also very important.Considering the above situation, the current work focuses on the monitoring of ambient air quality at granite mines using the ENVIROTECH APM equipment. The identification of the major pollutant is done by calculating the Air Quality Index from the monitoring results. quality. It is found that PM_{10} and $PM_{2.5}$ are major pollutants and it is also found that PM_{10} is major pollutant at the mine site and as the distance from mine site increases the $PM_{2.5}$ is identified as the major pollutant. It is found that the monitoring results are within the prescribed limits of CPCB. The various sources of these pollutants from the mining activities are identified and necessary preventive measures are proposed to maintain sound ambient air quality. Apart from water as dust suppressor, drills with dust extractors, dust collectors, and fog cannons are effective means to mitigate the air pollution.

KEYWORDS: Air Quality Index, major pollutant, ENVIROTECH APM, fog cannons.

1. INTRODUCTION

The mining industry directly and indirectly supports our everyday life. Most of the things we use in our daily life are made from minerals or depends on minerals for their production. In India mining is the major economic activity that contributes extremely to the country's economy. The GDP contribution of the mining industry varies from 2.2% to 2.5% only but when it comes to the total industrial sector it varies from 10% to 11% [1]. It also provides a fair amount of employment to the individuals. On the other hand, mining activities leads to various environmental pollution issues. These pollutions may include air, water, land and noise etc. the air pollutants such as particulate matter ($PM_{2.5}$ and PM_{10}) and gaseous emissions (CO_2, CO, NO_x, SO_2). These pollutants are usually released during drilling, blasting, loading, transportation, dumping and waste handling. In the cases of extraction of minerals which contain metals such as mercury, lead, silica and arsenic which are able to emission of metallic pollutants in to the ambient atmospheric air which are highly responsible for health effects. Therefore, air quality is the major concern in mining regions. Hence it is very essential to monitor these pollutants regularly and necessary control measures are vital to maintain a decent air quality.

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Crystallography of biotite of Nellore district, Andhra Pradesh, using XRD – analysis

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ABSTRACT

Mica is one of the most important and richest resources produced by India and is also found in many parts of the country in general and in Nellore, Andhra Pradesh and Rajasthan and Jharkhand in particular. It is one of many economic mineral deposits in the Nellore Belt. The mica pegmatites are observed to be intercalated along shear fractures developed in the crestal regions of the folds, along fault and foliation planes developed in the country rocks. The present study on biotite occurring in Kalichedu area of Nellore district of Andhra Pradesh aims to investigate the geochemistry of biotite by crystallography, i.e., XRD analysis determining crystal structure.

KEYWORDS: Biotite, XRD, Kalichedu, crystallography

1. INTRODUCTION

Mica mineral has two common occurences, light – colored muscovite, and dark colored biotite having a strong cleavage and can be formed as sheets in books (stacks) which is common in igneous and metamorphic rocks. Biotite, an important mica mineral, which is rich in iron and magnesium and occurs in large polymetallic deposits of igneous origin and it is dark colored mica, brown and black. Biotite containing magnesium and iron exibits green colour. Thin split leaves show bright spots, rings or halos. Hardness ranges from 2.5 to 3 and specific gravity varies from 2.3 to 3 [1]. Biotite can occur with muscovite in metamorphic rocks. The biotite mineral was collected from the Kalyan Rama mica mine of Nellore district at 14°17'54.0"N 79°42'55.0"E coordinates and the tests applied to the sample is XRD.

X-beam diffraction has been generally thought to be throughout the past 100 years to be the strong strategy for concentrating on the design of tests as it gives the data about the nuclear construction of solids, no matter what the substance idea of the example. Furthermore, it is utilized to decide the precious stone construction of a material; additionally entitles the check of the crystallinity and design of an example. beam Diffraction or Wide-point X-beam diffraction/WAXD, is a broadly involved method for deciding the translucent design of materials. Specifically, this method connects with the investigation of Bragg tops dispersed at wide points, which infers (by Bragg's regulation, $n\lambda = 2d \sin\theta$) that they are brought about by sub nanometer-sized structures. The diffraction design delivered permits to decide stage piece, and accordingly this procedure can likewise

CHANGES IN VEGETATION COVER USING GIS AND REMOTE SENSING: A CASE STUDY OF VISAKHAPATNAM, ANDHRA PRADESH, INDIA

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Abstract

Remote sensing is a critical technique for examining the global consequences of deforestation, land use changes, and climate change on forest stands. Forests play a critical role in the global carbon cycle as carbon sinks. The Google Earth Engine (GEE) and Landsat 8 photos were used in this study to examine the evolution of the Normalized Difference Vegetation Index (NDVI) through time in three study regions in Visakhapatnam, Andhra Pradesh, India. Temporal trends in the NDVI data from 2018 to 2020 indicated that, while NDVI increased across the board from 2018 to 2019, it has been rapidly falling in recent years (2019-2020). This drop in NDVI is associated with land use change, which has a detrimental influence on biodiversity, ecosystem function, and ecosystem services. Temporal patterns vary significantly across deciduous and coniferous trees, as well as within and between research sites. The study region had the most consistent NDVI development in recent years, whereas the NDVI in other areas increased more rapidly, indicating urbanisation. Remote sensing of forest stands is projected to become much more critical as climate change progresses.

Keywords: NDVI, Remote Sensing, Waste lands, GIS, Vegetation, ArcGIS.

1. Introduction

Vegetation is an important part of terrestrial ecosystems and helps connect the pedosphere, atmosphere, and hydrosphere (Bao *et al.,* 2014; Liu and Lei, 2015). It affects the carbon cycle, energy exchange, climate change, and water cycle of different ecosystems in both direct and indirect ways (Zho *et al.,* 2019). However, global warming, unjustifiable human interference, de-forestation, shrinking wetland areas, grassland degradation, encroachment on farmland, and deserts have led to the atrophy of vegetation in different ecosystems over time and across different parts of the world (Rajasekhar *et al.,* 2020a and 2021). Dynamically monitoring the vegetation changes in terrestrial ecosystems is important to understand how they fit into the global material cycle and energy flow and how humans can use natural resources in a way that is safe (Yu *et al.,* 2018; Dar *et al.,* 2020). Using satellite sensors, remote sensing techniques have become very common because they can cover a wide area and keep track of vegetation growth for a long time (Chu *et al.,* 2019). Many people use vegetation indices, such as the NDVI, to look at how remote sensing data can be used to look at how different types of vegetation are in different places (Myneni *et al.,* 1998; Eastman *et al.,* 2013). According to Wu *et al.,* (2007) they looked at NDVI data over time to see how vegetation changed around the world as well as how it reacted to changes in temperature. Piao *et al.,* (2011), looked at the NDVI from 1982 to 2006 to

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SUBSIDENCE ANALYSIS ON THE PERFORMANCE OF THE FLYASH

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ABSTRACT

This project is to understand the physical, mechanical and chemical properties of fly ash. fly ash is versatile engineering material which is being utilized effectively in civil, mining & agricultural sectors in order to reduce the open dumping of fly ash which causes severe air pollution etc. Fly ash is used as a stowing material in underground mines, so it's essential to have a clear knowledge about the subsidence behavior of fly ash in relation to the traditional sand stowing. Fly ash was tested for the compression behavior under dry conditions in a pit. The observations are recorded frequently, later on stress analysis was performed using ANSYS workbench2023 software. Equivalent stress and total deformation test was conducted under varying load. XRD test was also conducted on the fly ash sample. It is observed from the experiment that fly ash is having more yielding behavior so excessive precautions should be taken in order to control the subsidence over the ash stowing.

KEYWORDS: *Fly ash, subsidence, physical, mechanical properties, XRD test*

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I. INTRODUCTION

The demand for power generation has increased to fulfil the necessity of humans. Coal is the leading resource material for power generation in thermal power plants. In India, coal is mostly used for thermal power generation, which accounts for over 69% of the country's total power generation [1]. The generation of fly ash is increasing as the power supply demand increases. The research on utilization of fly ash had been studied by the researchers throughout the years, and their suggestion had been implemented in a different industry.Subsidence is a time-dependent process, either natural or man-induced, in which there is a lowering of the ground surface in response to the removal of gas, liquid, or solid matter. [2].The stable subsidence reduction rate by Backfilling in Separation (BIS) is **35%**, and the occurrence of the maximum subsidence rate is delayed, so BIS effectively contributes to the reduction of ground subsidence and subsidence. [3].In this article, tests have been conducted simultaneously on ash and sand to observe relative settling velocities and appropriate conclusions has been drawn. Researchers have conducted the subsidence analysis in consideration with graphical-profile function, Influence function, Numerical modelling and Empirical method [4].A mixed material with a gangue to fly ash ratio of **1: 0.35** was backfilled into the underground goaf. This process allows us to safely dispose of approximately **3.0084×10^6 tons** of solid waste annually. After the demolition of the backfilled walls, the maximum surface settlement was only **170 mm**, well below the level of extreme deformation normally considered necessary to damage surface buildings. Backfill mining of gangue and fly ash mixtures is an effective and environmentally

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Slope Stability Analysis Using Ansys Software

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ABSTRACT

In this paper, we introduce a slope stability analysis method based on the finite element method in Open pit mining this mining which accounts for about 95% of India's total coal production. As a result, open pit mines are reaching deeper mining depths. This complicates the stability of the working slope and the final design of the pit slope. As a result, 18% of open cast mining accidents are due to slope failure. These failures result in loss of production, loss of life, additional tailings costs for recovery and handling, and potential mine abandonment/early closure. Slope stability analysis is used for safer operating conditions in mining and has increased its importance.

The basic objectives of this project are mainly: a) Understanding the different types and causes of slope failures. b) Analyzing the slope safety factor. We also collect information on slope parameters and types of slope failures that occurred at open pit mines, as well as knowledge about the causes of slope failures. The main goal is to find solutions to control slope failure and maintain slope stability. The finite element method is one of the best methods for analyzing gradient parameters. Literature review revealed that the finite element method using ANSYS software is the best numericalmethod for slope stability analysis

KEYWORDS: Open pit, Factor of safety, ANSYS, Numerical method;

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I. INTRODUCTION

At present, there are many methods for slope stability analysis to solve the slope failure problems in mines. There are two types of mining: open pit mining and underground mining.

This means open pit mines are going to deeper mining depths. This means that mining slope stability and the final design of the slope are difficult to achieve. For example, 18% of accidents in surface mining can be traced to slope failures. Slope failures are primarily due to the effects of gravity and soil infiltration forces. Failures can also be caused by excavation, gradual dissolution of the soil/rock structure, and improper design of the pit slope angle. The pit embankment should be sloped at a certain angle to prevent falling rocks. This angle is determined by the geo-mechanicalconditions of the particular mine. The actual slope angle used in a mine will depend on the presence of haul roads, ramps required to transport the blasted ore out of the pit, ore grade, and economic constraints. Slope failures cause production losses, fatalities, additional overburden costs for recovery and treatment, and in some cases lead to mine abandonment/premature closure. On stable slopes,

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Hydrogen Generation in Indian Coal Mine Water: An Experimental Analysis

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ABSTRACT

Mineral consumption is increasing continuously in the world, so most mining industries are using heavy earth moving machinery (HEMM) to meet their production targets. While HEMM is used to extract minerals from the earth crust, the machinery consumes fuel that increases carbon emissions, which have an adverse effect on the environment. In addition, the demand for fossil fuels has increased due to geopolitics, and the depletion levels of fossil fuels have led to consideration of alternative fuel sources. In this article an experimental analysis was performed to produce hydrogen from mine water.In this experiment, electrolysis process are used combine with aluminium foil. The electrolysis is a method where we use electrodes and power to separate ions and produce hydrogen gas. The generation of hydrogen by using aluminium foil and sodium hydroxide involves a chemical reaction between the aluminium and the sodium hydroxide solution.The comparison will be made with different methods of hydrogen generation with the influence of different factors like temperature, pH value, chemical likesodium hydroxide, and aluminium foil. A study concludes that aluminium foil and sodium hydroxide can provide a low-cost, low-energy hydrogen production solution by using aluminium foil and sodium hydroxide. The results of this research can contribute to the development of a sustainable and clean energy system, reducing the dependence on fossil fuels and mitigating the environmental impact of energy production.

KEYWORDS: *Carbon emissions, Fossil fuels, Hydrogen,Mine water*

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1. INTRODUCTION

The energy demand is continuously increasing and the majority of nations rely on fossil fuel-based processes, which are inefficient and harmful to the environment. [1].As a result, there is an increasing demand for alternative, sustainable, and clean energy sources like solar, wind, hydraulic and green hydrogen. India complies with Paris agreement to reduce its emissions by net zero by 2070, and increasing the GDP emissions intensity by 33-35% by 2030 compared to 2005 levels [2].It is not feasible without decarbonization of mining sector. The electrical energy is alternative fuel source which needs lithium and cobalt mineral resources for manufacturing of electrical batteries for mobile equipment like dumper, truck. The limitations of batteries emit the carbon limited power and increase the weight of the machinery [3]. Hence the hydrogen is a best alternative to minimize the emission of carbon in mines.

The national hydrogen mission has been launched by union cabinet on 4th January 2021 [4]. In order to produce green hydrogen in the future, businesses like

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Generation of Electricity by Utilizing Mine Exhaust Air

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ABSTRACT

The energy demand of the world has become unbridled. With increase in energy demand, the conventional sources of energy (fossil fuels, nuclear) are encumbered with monumental pressure and hence, if use of this continual then it leads to deficiency of fossil fuels. This has provoked extensive research into the area of non-conventional energy sources like hydro, wind, thermal energy, etc. In recent years the scientific and public awareness on environmental and energy issues has brought in major interests to the research of advanced technologies. This paper deals with the production of energy by using mine exhaust air. The exhaust air from the mine is using as motive force to rotate the wind turbine. The wind turbine is placed accurately Infront of the exhaust air. The exhaust air from mine which was captured by exhaust fan expels on the wind turbine. The kinetic energy of air converts into the electrical energy.

KEYWORDS: *Mine exhaust fan, wind turbine, ventilation.*

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I. INTRODUCTION

Energy plays a crucial role in modern societies. It has a vital input to all sectors (e.g., residential, transportation, and manufacture) and is essential to generate electricity. In other words, all societies require energy services to meet basic human needs such as lighting, heating, and mobility. Thus, energy is not just a regular commodity, rather it is a strategic one and is the lifeblood of today's civilization. In the last several decades the world was heavily dependent on coal, oil, and natural gas to meet its energy needs. To be sure, these fossil fuels still dominate the energy mix in most countries today and are projected to continue this domination in the foreseeable future.

Renewable energy comes from sources or processes that are constantly replenished. These sources of energy include solar energy, wind energy, geothermal energy, and hydroelectric power. If use of this continual then it leads to rapid depletion of natural resources and fossil

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Monitoring blasting operations using multiple GPS tracking points

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ABSTRACT

The First stage of the mining operations is drilling and blasting. Majorly accidents in blasting operation causes due to the blast are security, fly rock, misfires and premature blast .the major of the percentage of causes blast area security and fly rock has registered high percentage of accidents, we arrange the GPS tracking to the workers to monitoring the blasting operations to reduce the accidents in blasting operations with real time monitoring

KEYWORDS: *Blasting, GPS tracking, Tracking application.*

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I. INTRODUCTION

Mining is the operation of extracting ore minerals from the earth crust also mining is the one of the major industry for the economy & development of the country. The five stages in the mining operations they are Drilling, Blasting, Loading, Transportation, Crushing. The first phase of the mining operation is drilling and blasting.

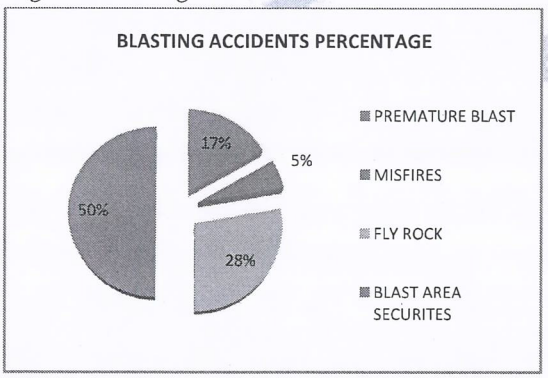

Fig.1: Blasting accident data in mines

Blasting is the process of breaking rock into small pieces using high explosive. Blasting operation the main causes for accidents is blast are security, fly rock, misfires and premature blast.as per accident data the major accident causes is blast area security and fly rock.fig.1 represents the data of percentages of blasting accidents in mines.

1.2 BACKGROUND WORK:

Researchers and scientists have studied the major causes and accidents due to the blasting accidents in mines [1] Bajpayee et al., (2004) analysed the blasting injuries in surface mining and observed that Fly rock and lack of blast area security accounted for 68.2% of these injuries &In (2004)analysed the fatal injuries due to lack of the blast area security due to several factors done for improper blast security& In (2002) analysed fly rock and blast area security fatalities from 1989 to 1999

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Drowsiness Detection System: A Technological Approach for Accident Prevention in Mining

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ABSTRACT

In recent years, driver's drowsiness has been identified as the leading causes of road accidents. It is crucial to prevent such accidents, especially in the mining sector, where they can lead to multiple fatalities, serious physical injuries, and significant economic losses. Various sleepiness detection systems exist, but they are not properly implemented due to their high cost and complex design. Therefore, an alternative system that can recognize early signs of sleepiness and alert the driver is required. This paper presents a prototype of a drowsiness detection system using an IR sensor, which can be used to detect the time period forclosure of the driver's eyelids. TheGoggles are attached with theIR sensor to identify the drowsiness. After development and performance evaluation of proposed model, the results conclude that using an IR sensor as an eye blink sensor to determine the driver's level of drowsiness is feasible with an accuracy rate of 84% after testing. It also provides improved portability and cost-effectiveness.

KEYWORDS: *Drowsiness detection, IR sensor, Arduino, Mine Accidents, Alerting system.*

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I. INTRODUCTION

Drowsiness driving is the most common cause of road accidents worldwide, resulting in more crashes each year than speeding, drunk driving, and other major accident causes combined. According to the National Safety Council (NSE) United States, drowsy driving causes approximately 100,000 crashes, 71000 injuries, and 1550 fatalities each year [1]. According to DGMS Technical Circular No. 03 of 2013, an analysis of fatal accident statistics in coal mines from 2006 to 2011 revealed that out of 135 accidents in opencast mines, 58 were caused by dumpers, 59 by tipper trucks, and 18 by other vehicles. All of these are vehicle-related accidents, with the majority of them caused by driver distraction. Drowsiness in drivers can occur as a result of long work hours and poor sleep habits. It is especially dangerous in the mining industry, where human error can lead to significant material damage and human injury [2]. According to one survey, drowsy driving accounts for nearly 40% of all road accidents [3]. So, many innovative systems are designed using various methodologies to eliminate such mining accidents, prevent them from occurring, and alert drivers. Drowsiness has been monitored using various methods, such as vehicle-based measures, behavioral measures, physiological measures, and questionnaire-based subjective measures, all of which were developed by researchers [4]. Using a camera, the behavioral measures detect any drowsiness symptoms (yawning, eye closure, eye blinking, head position, etc.) and alert the driver if any of these symptoms occur [5]. The

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Application of RFID Monitoring System for Identification of Mine Workers

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ABSTRACT

In the mining industry safety is a very important factor because there are lot of accidents that occur during mining operations. Nowadays accident rate is increasing day by day. The mining accidents like roof fall, side fall, sudden unconscious of a person, inundation, air blast, emission of gases, and loss of a person during and after working hours. In that case identification of the person's location is very difficult. For the solution of identification of the untraceable location of the person we are using an RFID system for the tracking and monitoring of the workerslocation. In the mines, manually recorded attendance of all the employees has producedsome problems such as, data inaccuracy and counterfeit attendance so, RFID is very helpful to identify and eliminate these kinds of actions and the discipline attitude of the employee,which also improves the performance of the staff gradually.In this work we are implementing this RFID monitoring system to locate the zone of workingplace of workers.TheRFID tags are provided for each worker and the RFID readers are placed in various zones of work in underground. The worker needs to mark his presence for every RFID reader the worker passes through.From this the present zone of workers location is identified. The modelling and working of thismonitoring system is developed.

KEYWORDS: Mining, RFID, Monitoring, Node-MCU, Rescue

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I. INTRODUCTION

In miningthe extraction of mineral reserves there are two types of methods. Opencast and underground. In opencast mining less accidents occur throughout mining operations compared to underground because of loss of mild and various underground environmental situations. In opencast mining the workers seen in each point in mine due to daylight. Break out of people is easy and brief, coming to underground mining there's no right lighting fixtures association in underground and identification of hazard is tough in underground and escaping from threat is likewise tough and identification of trapped workers in underground is difficult because of extra wide variety of seams and panels and growing intensive in conjunction with the extraction. Rescuing of character is hard because of inadequate records approximately the region and quantity of individuals trapped in the mine. To conquer those conditions, RFID system is very helpful in mines.

"Radio Frequency identification" (RFID) refers to a wireless device made out of two additives: tags and readers. The reader is a device that has one or greater antennas that emit radio waves and receive indicators again from the RFID tag. Tags, which use radio waves to communicate their identification and different

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Noise Mapping in Opencast Mines

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ABSTRACT

In this paper, we introduce a noise mapping in opencast mines So far mining industry playing a major role in all industries. In mining industries noise pollution is generated from Operation of equipment, transportation of mineral from one place to another place by the conveyor or by using dumpers, And Excavation, which affects mine employees. Although in the Recommendations of Tenth Conference on Safety in Mines, noise mapping has been made mandatory in Indian mines still mining industry are not giving proper importance on producing noise maps of mines. Noise mapping is preferred for visualization and its propagation in the form of noise contours so that preventive measures are planned and implemented. The study was conducted in Dalmia Cement Bharat Limited Chinnakomerla village, Kadapa district, Andhra Pradesh. Sound sources were identified, and noise measurements were carried out according to national and international standards. With the help of SL-1352 Sound level meter. Noise maps were generated by QGIS 3.28 Firenze software (Quantum Geographic Information System) QGIS functions as geographic information system (GIS) software, allowing users to analyze and edit spatial information, in addition to composing and exporting graphical maps. QGIS supports raster, vector, and mesh layers. Vector data is stored as either point, line, or polygon features. By these data we made noise mapping and found some precautions to control the noise production like, upgrading of all engine silencers, Sound-absorptive material should be installed on the walls and roof of the operator's compartment, plantation around the mine, water usage at the time of drilling, conveyor maintenance, using earmuffs, control blasting etc.

KEYWORDS:*QGIS, HEMM, OPENCAST, SLM, MAPPING.*

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I. INTRODUCTION

All the unit operation in surface mining, example drilling, blasting, excavation loading, transportation, reclamation are processing that involve numerous noise-generating activities. Introduction of mechanization and large-scale machinery has undoubtedly accentuated the problem in recent years. The availability of large diameter, high capacity of pneumatic drills, bulk blasting, etc. are identified as noise prone activities. In-pit crushing system with mobile crusher and large capacity materials handling plants are being installed to facilitate speedy handling of large quantities. All these activities are major sources of noise in and around surface mining complexes. Noise as an environmental factor has important implications for the exposed population. The obvious implication is, of course, the potential for noise-induced hearing loss. In addition, noise produces other health effects, influences work performance, and makes communications more difficult. Besides, the wildlife in the forests and other areas surrounding the mines/industrial complexes are being affected by the noise generated due to mining activities. In order to combat this, many countries and communities have introduced laws and regulations making it a legal requirement to measure occupational and community noise levels in and around mining/industrial complexes

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Reliability analysis of percussive rotary drill bits in consideration with their failure modes

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ABSTRACT

Efficient drilling is essential in rock drilling for the overall production. Drilling bits are the consumable elements in drilling process and their working hours in the field is important with respect economy. The reliability study of drilling bits is important as it indicates the overall effective production. The present study estimates the reliability of percussive drill bits based on failure hours. This study also study the best fit Regression model against the failure hours. The relevant data pertaining to this study has been collected from Granite mine. The outcome of this study is helpful to understand the different failure modes of drill bits and their bit life assessment with consideration of Compressive strength

KEYWORDS: *Percussive Drill bits, Compressive strength, Bit failure mode, Drill bit life, Regression model, Anova Approach*

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I. INTRODUCTION

Percussive rotary drilling is the most common drilling method is used for hard rock exploration and also for drilling blast holes. The drill consists of a bit (steel crown) with cemented carbide inserts. The dimensions of the steel crown varies with application and rock properties [1]. The Wear of WC (tungsten carbide) and cobalt (co) compositions used in the inserts of a drill bits is surveyed by Larsen-Basse.J. They addressed that the relationship between drilling variables and wear and the influence of structure and composition of the tungsten carbide-cobalt sintered alloy drill bits on their wear-resistance [2]. The new view and the understanding grates can hopefully be utilized for making better selections of cemented carbide grades based on local wear conditions and also for future development of new WC/Co grades, better adapted to the complex conditions of rock drilling. Liang et al. Through a detail analysis of the mechanical failures in the drilling rig encountered during construction in hard formations, key parts of the rotary drilling rig work rig were improved and improved, including the design of the removable compound drive. The test results show that the improved percussive rotary drilling rig's construction efficiency and life are clearly increased [4]. The UCS of the rock is closely correlated with the bit life. The insert failure in percussive rotary drill bits is found to dominate the complete failure of the bit [5].The present research presents the various modes of failure of percussive rotary drill bits in the Granite mine by the comprehensive study of the drill bit life time in the field, this study also determines the reliability of percussive rotary drill bits.

1.1 FAILURE MODES OF DRILL BITS

During drilling with percussive rotary drill machine the drill bit effected due to the following mechanical properties of the rock are hardness, strength, abrasiveness, structure of rock etc. the drill bit may tend fail in various modes, those are

a) Button failure due to large radial force
b) Twisted breakage failure
c) Failure due to corrosion
d) Buttons failure due to incorrect attachment with drill

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Failure Prediction of Hydraulic Shovel Using Fault Tree Analysis

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ABSTRACT

Demands of Hydraulic shovels are continuously increasing in Indian opencast mines due to low production cost and high efficiency. Hydraulic shovels consist of large number of electrical, mechanical and hydraulic components and it is complex in design. This study involves the identification of basic root causes that are responsible for the occurrence of failure in hydraulic shovel by fault tree quantification analysis. The fault tree analysis is conducted on hydraulic shovel for predicting the shovel failure by using basic logic gate for components and its root causes. The gate-by-gate method was used to identify the probability relation for the identification of inter-relation in consecutive basic or intermediate to top event is presented. This paper, overall failure of shovel is estimated as well as the contribution of the subsystems or components in the overall prediction of failure are identified. The results showed that the categorized events (Power Generating Unit, Power Developing Unit and Power Utilizing Unit) in hydraulic shovel are having the probability of failures are 0.047, 0.0036, and 0.004 per hour respectively. These categorized intermediate events are contributed to failure of hydraulic shovel (Top event) and the probable failure of top event is 0.055742 after 2 years of operation. The study may provide a reference for future work related to the hydraulic shovel analysis, design and maintenance.

KEYWORDS: *Hydraulic Shovel, Fault Tree Analysis, Time to Failure, Reliability, Opencast mining*

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1. INTRODUCTION

The demand of coal continuously increases throughout the world so the demand of HEMM required more to fulfill the target production [1–3]. In India there is 93% of coal producing by the opencast coal mining using different combination of HEMM to remove the overburden like dumper-shovel combination about 60% and dragline about 40% [4,5]. When the any failure occurrence in HEMM directly affects the productivity and reduces the reliability and safety [6,7]. The hydraulic shovel is a capital-intensive HEMM used in opencast coal mines to load the dumper [3]. Although today's shovels are very technologically advanced equipment and use the best engineering innovations, the harsh working environment of mining operations leads to breakdowns that increase the downtime losses and maintenance cost. Fault Tree Analysis (FTA) is used to predict bucket failure and understand how a bucket might fail, identify the best ways to reduce risk, and determine the frequency of occurrence of a safety incident or failure of a specific functional level [8,9]. FTA maps the relationship between faults, subsystems, and redundant elements of the safety design by creating a logic diagram of the entire system. Problems are associated with the hydraulic shovel in surface mines, which is highly time-consuming due to various breakdowns, maintenance time, repairs, etc. At the time of machine repairs and other shutdowns, they lead to production stoppages. Drawing fault tree for determining the events associated with a hydraulic bucket failure. By performing time study on a hydraulic bucket, it was found in many cases which parts of the bucket are responsible for failure and where it consumes time.

1.1. Introduction of hydraulic shovel

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Water Quality Assessment of Mine Tailings in a Baryte Mine

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Kumar C A, Ashok Yadav B, Harshavardhan Reddy k, Vijay Kumar Reddy T, Vikash Kumar S, "Water Quality Assessment of Mine Tailings in a Baryte Mine", *International Journal for Modern Trends in Science and Technology*, Vol. 09., Issue SI02, March, 2023, pp.-57-62

ABSTRACT

Mining is the backbone of the development of our country. Mining is the process of extracting minerals economically and safely. By extracting the minerals, the environment is disturbed. One of the environmental effects is water pollution. For mining activity water is necessary for different purposes like drilling, stowing, and mineral processing. Most of the water is used for mineral processing. The water which was used for mineral processing and other purposes was polluted with contamination. The contaminated water causes many diseases to the people. In this paper, collected baryte tail water from the Varalakshmi baryte mine and a collected water sample are evaluated in the laboratory. By evaluating the sample in the laboratory analyzed and identified the various physicochemical parameters and water quality index. The water quality index of baryte tailwater is 55.493 &57.759 was found from the laboratory results, based upon these results the quality of Baryte tailwater is poor. Based on the results proper treatment is given to the tailwater for using different purposes.

KEYWORDS: *Baryte tail water, physicochemical parameters, water quality index.*

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I. INTRODUCTION

In India, there are 3100 mines, out of these 550 are fuel mines,560 mines are metal mines and 1970 are non-metal mines. Baryte is a non-metal mineral. The total reserves of barite mines in India are 70,146,559 tonnes. In Andhra Pradesh, nearly recoverable reserves are 67,053,540 tonnes (95.5%), so they can say that Andhra Pradesh is the major source of the baryte. In Andhra Pradesh, the barytes are present in Ananth Puram, Kadapa, Krishna, Kurnool, Nellore, and Prakasam districts. In Ananth Puram 31140 tonnes, In Kadapa 17,038,751 tonnes, In Krishna 3,500 tonnes, In Kurnool 38,395 tonnes, Nellore 3,18,678 tonnes, In Prakasham 48,520 tonnes are available. From this, we can say that Kadap is the first place in the baryte resources in Andhra Pradesh. Rajasthan is the second state for the production of barytes, It consists of 2,357,732 tonnes (3.36%), followed by Bihar contains 15,160 tonnes (0.02%), Himachal Pradesh 12,296 tonnes(0.17%), Karnataka 9,105 tonnes(0.01%), Madhya Pradesh 1,93,328 tonnes(0.27%),Tamilnadu 1,17, 184 tonnes(0.16%), Maharashtra 165, 215 tonnes(0.09%), West Bengal 303, 000 tonnes(0.43%) and Uttar Pradesh 20,000, tonnes(0.02%). Baryte is used in the chemical industry for the preparation of barium products like barium sulfate, Oxides, nitrate, chlorides, carbonate, hydroxide, and peroxide. it is used as a filler in paints, oil, photographic paper, and rubber. It acts as a lubricant and it is used for the manufacturing of x-ray tubes, glass industries, and ceramics.

The hardness of Baryte is very low (2.5 to 3.5mohr's scale) so it is very easy for breaking. Baryte is a sedimentary rock and it occurs as layers. Most of the baryte mines in India are operated by a shaft sinking. Initially is broken by the blasting operation then, the blasted material is transported to the surface. After reaching the blasted material to the surface they

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Optimal recovery of iron minerals from low grade iron ore taillings

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ABSTRACT

This paper mainly deals with the recovery of high-grade iron ore from tailings. This work consists of collection of iron ore tailings from the mine site and processing of tailings for recovery of high-grade ore. The ore is collected from NMDC, Bellary, Karnataka, India. After the sample is collected, the ore is prewashed to remove any impurities. After cleaning of ore, the ore is segregated for the purpose of analysis. To select the specified quantity of ore, the sample is chosen by sampling methods like cone and quartering and bulk sampling. From the sampling methods the ore sample is chosen from a bulk sampling and Cone & Quartering method is subjected to grain count analysis a total sample of around of 70 kgs and reduced to 1kg. After the sampling the ore is processed for grade identification and recovery of high grade from low grade by some of the unit operations like crushing, grinding, and ore refrigerating for specified size of particles. In the Unit operations the in initial feed size of was reduced finer size of 24 B.S.S mesh size using crushing after that the ore is further reduced to size of 200 B.S.S mesh using ball mill. Now the low-grade ore is subjected to microscopic studies for determining the grade of ore by grain count analysis of ore from the analysis. We found out the grade of iron ore tailings and the grade was estimated to be 15-20% of concentration in the sample. Now using magnetic separation, the initial concentration of ore is increased to 50% concentration. In second part, we are doing ore processing analysis, Ore treatment and recovery of high-grade ore.

KEYWORDS: *ore sampling, pre-processing, ore treatment*

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I. INTRODUCTION

Iron ores are rocks and minerals from which metallic iron can be economically extracted. In mining tailings are the materials left over after the process of separating the valuable fraction from the uneconomic fraction of ore {1}. Coning quartering process is a method used by analytical chemists to reduce the sample size of a powder without creating systematic bias {2}. bulk sampling is defined as the process of extracting a small fraction of material form a large sufficiently representative for the intended purpose {3}. removing of waste Grain size analysis is a typical laboratory test conducted in the soil mechanics' field {4}. Crushing is the process of reducing the size of materials so that they can be further processed {5}. They are two types crushers are used 1) primary crusher 2) secondary crusher. Magnetic separation is the process of separating components of mixtures by using a magnetic to attract magnetic substances. a ball mill is a type of grinder used to grind and blend bulk material into QDs/nano size using different size balls. Materials to liberate the useful materials in this work we perform the pre washing of ore to remove the all the gangue materialspaper has been accepted, prepare it in two-column format, including figures and tables.

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Failure Analysis of Dragline Using Dynamic Bayesian Network

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ABSTRACT

The failure occurrence of Heavy earth moving machinery (HEMM) reduces performance, productivity, and reliability of the machines. Undesirable failures increase the likelihood of accidental activities of maintenance and effect its reliability. Draglines are used in the opencast mine to removal of overburden, and excavate the earth material. In this paper, failure analysis of dragline using dynamic Bayesian network (DBN) to determine the critical failure components of the dragline system and their responsible root causes. The failure data of dragline are categorized into three group namely; structure, machine house, bucket. The DBN used to make a causal relationship between various failure components their root cause and maintenance action. Statistical analysis used to validate the collected data and regression analysis are used to identify the relationship between i^{th} and $(i-1)^{th}$ failure of dragline system. The sensitivity analysis used to identify the most critical components of dragline. The result of sensitivity analysis shown the thirteen critical components are identified. Therefore, it should be prioritized in the various components of the maintenance prioritization of these components minimized the failure and downtime losses of dragline.

KEYWORDS: *Failure Analysis, Dragline, Dynamic Bayesian Network, Opencast Mining*

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I. Introduction

Mining industries are focusing to improve the reliability and maintainability of heavy earth moving machinery (HEMM) by improving the performance to achieve the annual targeted production [1,2]. The reliability is the function of time [3,4]. The Time to Failure (TTF) and Time to Repair (TTR) data is employed to find the statistical lifetime distribution of the component of the dragline. Dragline is a capital-intensive HEMM which consists of various electrical mechanical and hydraulic components. When the failure occurs in the one component it directly affects the whole system performance and reduces the reliability. In order to improve the performance and minimize the maintenance cost, the reliability of the various components of dragline is estimated and prepare the maintenance policy [5,6]. While the present scenario of regularly raising demand for coal mining industry uses advanced HEMMs like a dragline, shovel, dumper, drill machinery. The occurrence of failure of dragline decreases the safety, reliability and increases the downtime losses and production losses [7,8]. It describes that unwanted failure that impacts the machine performance and maintenance cost also affects. The dragline machine excavates up to 30-40% of the total operating cost [9,10]. In order to reduce the failure, need

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Methane hydrate thermodynamic phase stability predictions in the presence of salt inhibitors and their mixture for offshore operations

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ARTICLE INFO

Keywords:
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ABSTRACT

A thermodynamic model is developed and used in this study to predict the phase equilibrium conditions of a methane -aqueous salt inhibitor -water hydrate system. The modified van der Waals-Platteeuw (vdWP) model is used to calculate the equilibrium condition of the hydrate phase. To compute the fugacities of gas and liquid phases, the Peng-Robinson equation of state (PR-EoS) and a previously developed Pitzer-Mayorga-Zavitsas-hydration model are used. The model predictions are compared to experimental results on methane hydrate phase equilibrium in the presence of an aqueous salt inhibitor. The absolute average relative deviation in predicted methane -aqueous salt inhibitor -water hydrate equilibrium pressure (AARD-P%) with the developed Pitzer-Mayorga-Zavitsas-Hydration model is 3.59% for CH_4+NaCl, 1.52% for CH_4+KCl, and 2.70% for CH_4+ $CaCl_2$. Finally, the hydrate suppression temperature caused by aqueous salt inhibitors and their mixtures on methane hydrate phase stability is calculated, and it is $CaCl_2$>KCl>NaCl in that order. This work's phase equilibrium model demonstrates the potential application of determining methane hydrate equilibrium conditions in the presence of aqueous salt inhibitors and their mixtures used in offshore oil field applications.

1. Introduction

Gas hydrates are chemical compounds formed when water and guest gas molecules combine at high pressure and low temperature. With a lower recovery rate, the total global gas hydrate deposits are estimated to be 43,311 TCF in the deeper regions. Many countries are still conducting research to identify and test gas hydrate reservoirs, including Japan, Korea, China, the United States, Canada, and Taiwan. Drilling of gas hydrate reservoirs in deep water drilling regions, i.e. offshore oil fields, is a potential source of hydrate formation when combined with water-based drilling muds under high pressure and low temperature conditions. Two regions of hydrate formation have been observed in the presence of water-based drilling muds. In the first region, the hydrate can plug or form a large solid mass near the well bore, causing well bore instability. Second, hydrate forms inside choke lines, kill lines, well circulation paths, and nearby blowout preventers, causing well bore equipment to fail mechanically [1,2]. Water-based drilling fluids provide water availability for hydrate formation in deep water drilling [1,2]. Barker and Gomez [3] examined two case studies, the first of which described hydrate formation drilling operations in 1150 feet of water off the west coast of the United States. Second, hydrates were discovered while drilling a well in the Gulf of Mexico at a depth of 3100 feet. Well control is finally achieved after several attempts at safe drilling techniques. Depressurization, dewatering, heat addition, and inhibition methods are most widely using for preventing the formation of gas hydrate. Inhibition of hydrate with the help of thermodynamic inhibitors such as salts (NaCl, KCl, and NH_4Cl), glycol, and both mixtures is the most commonly used method in the oil and gas industry. Thermodynamic inhibitors are used to prevent hydrate formation by shifting the hydrate (H)-liquid (L)-vapor (V) phase equilibrium conditions to low temperature and/or high pressure conditions. Holzammer et al. reported that the ions in the salt (inhibitor) solution interact with water molecules via columbic force (i.e. ion-water molecule interactions). As a result, the water molecules are not freely available to form hydrogen bonds, increasing the salt's inhibition efficiency on hydrate formation. As a result, the greater the dissolution of salt in water, the steeper the hydrate phase shift curve [4]. For the prevention of hydrate formation in deep water regions, it is critical to understand the methane hydrate phase stability in the presence of inhibitors (salts) using predictive models. Javanmardi et al. used an Aasberg-model Petersen's to calculate water activity in order to predict hydrate phase stability conditions in aqueous solutions containing electrolytes (salts) and alcohol [5]. Østergaard et al. proposed a new empirical equation to predict the hydrate phase stability in the presence of reservoir and drilling fluids along with various inhibitors such as electrolytes and al-

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RESEARCH ARTICLE

Statistical Optimization of mineral salt medium components for *Achromobacter xylos GSR21* production using Central Composite Design (CCD)

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ABSTRACT:

Background: *Achromobacter xylos* strain GSR21 plays a crucial role in bioremediation of fossil fuel contamination, biopharmaceutical, cosmetics, chemical, petroleum refining, petrochemical, food industries and tertiary oil recovery (MEOR). **Aim:** within the present paper, to reinforce the censorious medium constituents for the assembly of *Achromobacter xylos* strain GSR21 by using response surface quadratic models (RSQM). **Materials and methods:** Response surface method (RSM) was utilized to make your mind up the best degrees of cycle factors (agar powder, yeast concentrate, $FeSO_4.7H_2O$, and KH_2PO_4). CCD design of RSM was utilized to contemplate the four factors at five levels, and *Achromobacter xylos* strain GSR21 fixation was estimated as reaction. **Results:** Relapse coefficients were dictated by relapse examination, and therefore the model condition was settled. R^2 regard for bio-surfactant (g/L) was attempted to be 0.88, showing that the model fitted well with the exploratory results. Affirmation of the mathematical model was driven by playing out the examination with the foreseen updated values, and bio-surfactant yield was found to be 9.88 g/L. Endorsement of the foreseen model was fitted 98.8% with the test outcomes coordinated under the perfect conditions. **Conclusion:** In light of the above outcomes agar powder and yeast separate was perceived as compelling fragments for *Achromobacter xylos* GSR21 creation.

KEYWORDS: *Achromobacter xylos* GSR21, response surface methodology, central composite design.

INTRODUCTION:

Achromobacter xylos GSR21 are amphiphilic intensifies present in living surfaces, for the first part on microbial cell surfaces or delivered extracellular hydrophobic and hydrophilic moieties that present the adaptability to amass between liquid stages, from now on diminishing surface and interfacial bear the surface and interface separately[1-5]. They need the name property of diminishing the surface and interfacial strain utilizing similar instruments as produced blends surfactants.

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Surfactants are the dynamic decorations found in synthetic compounds and synthetic substances with the adaptability to assemble at the air-water interface and are typically wont to isolate smooth materials from a particular media on account of the way that they will build fluid dissolvability of Non-Fluid Phase Liquids (NAPLS) by lessening their surface/interfacial suffer air–water parcels oil interfaces[6-10]. *Achromobacter xylos* GSR21 are on a truly essential level portrayed by their substance structure and their microbial inception. The standard classes of *Achromobacter xylos* GSR21 are glycolipids, phospholipids, polymeric bio surfactants and lipopeptides (surfactin)[10-15]. The preeminent standard glycolipids are rhamnolipids, sophorolipids and trehalolipids[16-21]. Surfactants are broadly utilized for

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Consistent Rheological Behavior of Formate Based Fluid for Drilling and Workover Operations

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Formate based fluids are environmentally friendly and biodegradable drilling fluids that are compatible and solid free, contributing to eliminate formation damage. In this regard, they find their application in drilling fluids, as well as in completion fluids. In this work, three potassium formate based fluids of different concentrations such as 40, 50, 60 % w/w and water-based fluid (WBF) are prepared with help of additives namely, calcium carbonate, xanthan gum and ethylene glycol. The consistent performance of a drilling, completion or workover fluid is very much necessary for successful and economical drilling, completion or workover operation. Hence the synthesized fluid samples with various concentrations of potassium based fluids are analyzed for their rheological behavior at various temperatures and a function of time.

Keywords: Drilling fluid, Workover fluids, Formation, Rheology, Chemical additives.

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1. INTRODUCTION

Drilling and completion fluids are used while drilling and completing the workover operations to mitigate the well blowout and decrease the formation damage. The fluids need very high densities, and the formate salts of alkali metals can be used for such purposes. Many additives have been reported in literature [1, 2] to impart the required properties to the drilling fluids. The formats of potassium (KCOOH), sodium (NaCOOH), and caesium formate monohydrate (CsCOOH-H_20) are the commonly used as drilling and completion fluids owing to their very high solubility in water and their ability to result in high density fluids. The low viscous biodegradable formate-based alkaline brines are however less toxic to aquatic life offshore and have a wide range of properties. These fluids also act as a fluid loss agent for higher temperatures, have a low rate of hydrolytic, oxidative degradation and cause minimal corrosion to ferrous metals used in tubes. These fluids are used in slim and deep hole drilling to minimize frictional pressure losses and in formations with high temperatures and shales for formation stabilization. They also act as gas hydrate inhibitors and scale dissolvers. Techniques available for cost effective clean-up and recycling of formate-based drilling fluids have been reported in literature [3-6].

Gaurina et al. reported based on their laboratory study that at higher temperatures potassium formate-based fluid (DIF-3) has better rheological and filtration characteristics than water-based fluid (WBF). Potassium formate is reported to stabilize viscosifiers and fluid loss polymers, there by aid in enhancing the rheological properties at higher temperatures. At a temperature higher than 125 °C, inadequate rheological properties are reported for WBF and especially for potassium formate based fluids in the absence of PAC (DIF-1). The addition of 10 g/l PAC to the formate based fluid (DIF-2) gave satisfactory results. Further, an increase in the concentration of PAC (DIF-3) has not shown significant results [4]. Wang et al. reported that the formate based fluid is used in the deep well of the Lungu area in Tari during drilling and well completion. From the field experiments, the formate drilling fluid acts as a good shale stabilizer. The capability of bringing cuttings to the surface along with the shear thinning characteristics of the low viscous formate drilling fluid is suitable for meeting the drilling criteria in cutting carrying capacity characteristics. In case of formations with solid particles that can block the pores of the formation, the formate drilling fluid having low density with no solid phase can alarm and detect problems in the formation within less time and helps in reducing formation damage. Further, they exhibit excellent compatibility characteristcs with common treating agents of the oil field [5]. The objective of this work is to conduct preliminary experiments on different concentrations of potassium based formate fluids that are consistent in their rheological behavior with respect to time and temperature. Further in this study, other fluids properties required for both drilling and production operations of an oil and gas well are measured.

2. MATERIALS AND METHODS

2.1 Materials

In this work, three different concentrations of potassium formate and a WBF are prepared. The concentration of potassium formate in the first potassium formate based fluid (PFBF-1) is 40 % w/w. The concentration of potassium formate in the second potassium formate based fluid (PFBF-2) is 50 % w/w, and the concentration of potassium formate in the third potassium formate based fluid (PFBF-3) is 60 % w/w. The additives added to the three fluids are calcium carbonate, xanthan gum,

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Research Article

Sport and Performance

Isolation, Screening, Characterization And Application Of Biosurfactant By *Achromobacter Xylos* Strain GSR21 Producing Bacteria From Hydrocarbons Contaminated Soil

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Abstract: Biosurfactants plays a key role in tertiary recovery (EOR), and production, excessive minerals discharge from water during petroleum refinery process, environmental utilization and eco-friendly. Biosurfactant producing bacteria found to be sufficient in hydrocarbon-polluted soil samples; it is expected to more amounts of agrichemicals contemporary in the clay. These bacteria establish itself soil and region specific. So, in this study we made an attempt to identify and characterize biosurfactant produced by *achromobacter xylos* strain GSR21 from hydrocarbon polluted soil in Andhrapradesh, India. A battery of biosurfactant screening methods engaged were haemolytic activity, oil spreading technique, lipase activity, emulsification index (E_{24}), emulsification assay, tilting glass slide, blood haemolysis test, drop-collapsed assay, and foaming activity. The organism isolate was studied based on molecular, phenotypic, and biochemical methods. Thin-layer chromatography I(TLC), Fourier transforms infrared spectroscopy (FTIR) and gas chromatography-mass spectrometry (GC–MS) investigates were used to identify and characterize the biosurfactant produced. The isolated biosurfactant was applied on chosen hydrocarbons to measure its emulsifying capacity.The phylogeny study of the 16S rRNA classified the isolate as A *chromobacter xylos* strain GSR21. The sequence secured from the isolate has been accumulated in GenBank covered by the accession number JQ746488. The result obtained from the study acknowledge high biosurfactant action with a maximum emulsification index (E_{24}) of 62 % compared to emulsification index (E_{24}) of 72% by sodium lauryl sulfate (SLS). Moreover, the biosurfactant appear emulsifying activity against the following hydrocarbons: diesel, methylbenzene, kerosene, dimethylbenzene, and petrol. The optimum cultural conditions (incubation time, carbon, pH, hydrocarbon, inoculum concentration, nitrogen, and temperature) for growth and biosurfactant produced by A *chromobacter xylos* GSR21 were analysed. The biosurfactant was characterized as a glycolipid using thin layer chromatography (TLC), while the gas chromatography-mass spectrometry (GC–MS) technique analyzed the glycolipid as dodecanoic acid-undecyl ester.Present study has exhibited the magnitude of *Achromobacter xylos* strain GSR21 isolated from hydrocarbon-polluted soil to produce biosurfactant and the effectiveness of the produced biosurfactant in emulsifying different hydrocarbons. Moreover, the biosurfactant produced was established to be held by the class, glycolipid based on the thin layer chromatography (TLC) and gas chromatography-mass spectrometry (GC–MS) analyses.

Keywords: *Achromobacter xylos* strain GSR21, Biosurfactant, Dodecanoic acid-undecyl ester, Hydrocarbon-polluted soil, and glycolipid.

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Research Article

Thermodynamic Properties of A Binary system

Optimization of Thermo-Physical Properties For The Binary System Of Acetone–Water At 303.15-318.15 K By Response Surface Quadratic Model

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Abstract: Thermo bodily residences of binary liquid combos are very beneficial in biotechnology, pharmaceutical, chemical and petroleum refining industries for improved favoured products from diverse raw materials. The physical property data on mixed solvents are important for the theoretical and applied areas of research and are frequently used in many chemical and industrial processes such as design of new process and process equipment (fluid flow, mass transfer or heat transfer calculation) and designing of bioreactor/fermenter. The objective of the current paper is to determine the density, viscosity, ultrasonic velocity, refractive index and surface tension of acetone (1) + water (2) at temperatures of 303.15K to 318.15K for the complete composition degrees and atmospheric pressure. These experimental values were used to calculate the respective excess homes in conjunction with a few acoustic properties. The experimental facts and excess residences have been used to calculate the interacting coefficients and well known deviations from different existing models. Also the new model equations have been evolved with the aid of the use of Design Expert application for density, viscosity, ultrasonic velocity, refractive indices and surface tension. Experimental consequences have been analysed on the premise of molecular interactions among element molecules with the assistance of FT-IR spectrum. Acetone-water binary structures of the prevailing observer have positive values of excess molar volumes and deviations in isentropic compressibility over whole composition range and at all temperatures which suggests sturdy interactions among the components of binary mixtures. Thermodynamic observations of acetone and water mixtures were made. Negative viscosity deviation of acetone-water combinations suggests robust dipole-dipole interactions within the device. Fourier remodel infrared spectroscopy also indicates the sturdy interaction made at 3589 cm^{-1} and based on the response surface method outcomes, more interplay takes area at zero. Five and zero six moles of acetone and water combination and the consequences are conformed with reference to the R^2 cost (0.89). Excess molar extent and isentropic compressibility were decided and kinds of interactions have been discussed primarily based on the derived properties.

Key words: Density, viscosity, ultrasonic velocity, refractive indices, intermolecular interactions, FT-IR spectrum.

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Propulsive Performance and Optimum Configuration of Tandem Flapping Foils

Naga Praveen Babu Mannam and Venkata Ramana Avula

Abstract—**The application of tandem flapping foil propulsors to conventional aerial and underwater vehicles plays the most important role in the exploration of aerial and marine environments. The hydrodynamic study of fish schooling or birds' flock when swimming/flying in fluid media and the application toward the development of tandem flapping wing robots is gaining more importance in the field of bioinspired vehicles. The advantages of tandem flapping wing configuration are improved thrust performance, maneuvering, and less energy input as the downstream foils consume less power compared to the single flapping foil. In this study, the thrust of two flapping foils arranged in the tandem mode subjected to pitching motion with different pitching amplitudes (A_D), Strouhal numbers (St_D), streamwise distance (S/c), and phase lag (φ) of foils is studied numerically using the reynolds-averaged navier-stokes equation (RANSE)-based computational fluid dynamics solver. This novel study mainly investigates the effects of Strouhal number and the dimensionless pitching amplitude on the thrust and efficiency of tandem foils. It is observed that the tandem foils generate higher efficiency at $St_D = 0.2$. At this condition, the effects of streamwise distance and phase lag of tandem foils are also investigated. When φ is constant and S/c changes from 0.109 to 1, the efficiency of the upstream foil decreases and the efficiency of downstream foil increases. When S/c is constant and φ changes from 0° to 180°, the efficiency of the upstream foil increases and the efficiency of the downstream foil decreases with an increase in phase lag. When φ is 90°, the total efficiency of the two foils gets the maximum value. In general, when S/c is 1 and φ is 90°, the tandem flapping foils get the maximum propulsive efficiency. For achieving this condition, pitching amplitude, frequency, and increased phase lag between the two foils play a significant role compared to the streamwise distance (S/c) between the tandem foils.**

Index Terms—**Flapping foils, pitching mode, propulsive efficiency, Strouhal number, tandem configuration, thrust.**

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I. INTRODUCTION

THE bioinspired oscillating foil propulsors for conventional marine vehicles are highly efficient in terms of propulsion and maneuvering and are proven to be environment friendly. These propulsors create less turbulent wake around the ship hull or submarine hull and reduce the drag of the ship and, thereby, the fuel consumption. Thus, the application of bioinspired foils as a single propulsor or dual propulsors for marine propulsion and energy harness becomes the interesting point of view for various researchers [1], [2]. The effect of reverse Karman vortex on two pitching foils in the staggered arrangement; the upstream foil is subjected to free pitching and the downstream foil is subjected to force pitching. The streamwise distance and the transverse distance are defined as $c + s$ and h, respectively. The parameters Re (which is 220) and the pitching amplitude ($A = 1.335D$) are used in this study. By changing the relative position of two foils, the wake similar to reverse Karman street produces the thrust. The propulsive efficiency of two foils is achieved because a vortex pair appears at a leading edge of the downstream foil [3]. Different wake patterns of forced pitching foil at different amplitudes and frequencies are investigated. Several characteristic wake patterns are observed, including Karman wake, reversed Karman wake, 2P wake, and 2P+2S wake. From the wake pattern region in the map, it is easy to identify that which Strouhal number and dimensionless amplitude in the map can produce inverted Karman wake [4]. The drag of tandem rigid bodies at different Re and D parameters are observed that the following body experiences lesser drag compared to the leading body. When Re and the separation distance are large enough, the leading flag has smaller drag compared with the downstream flag. When Re and the separation distance are small enough, the leading flag has less drag [5]. The flapping flight vortex shedding and the frequency were studied using numerical simulations. It was found that the selection of frequency would cause unsteady aerodynamics [6]. The study of oscillating foil propulsive forces and efficiency measurements was recorded. The leading edge vortex plays an important role in generating high propulsive efficiency. The interaction of leading edge vortices and trailing edge vortices results in a reverse Karman vortex street [7]. The numerical study on the symmetric foil using ANSYS FLUENT 13.0 is carried out based on the given parameters [4], [8]. The study was focused on the effects of frequency f and amplitude A of the wake behind the foil. The time-averaged velocity at different positions of the wake is symmetry. The flapping foil in the pitching mode is studied by changing the amplitude and

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Study the environmental friendly filtration loss agents effects in drilling fluids

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ABSTRACT

A variety of policies have been implemented to preserve the environment by governments and environmental groups, for the efficient management of environmental challenges associated to onshore and offshore drilling and production activities. It is necessary to identify effective environmentally friendly muds and its additives to develop and to perform safe operations of drilling and production of oil and gas wells. In this work, three natural mud additives- coconut shell powder, peanut shell powder and cod cob powder are evaluated as another ecological filter loss control agent. The three similar natural mud additives are examined both individually and together in a comparative analysis of the fluid loss control agent. In comparison to the other two additives, the peanut shell with a 2.25% weight concentration is a more effective liquid loss control agent. The best results, however, were similar to those of the peanut shell additive sample and were achieved by combining the powders from peanut shell, coconut shell, and corn cob. The 1.5% and 2.25% weight concentration samples in three additive combination tests exhibit greater filtrate volume. The peanut shell is the best addition in comparison to all other samples and combinations utilised in this experiment because it is both inexpensive and environmentally safe.
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1. Introduction

In response to growing environmental safety concerns, the oil and gas sector is encouraging and demanding research on non-toxic drilling fluids and their additives, such as viscosity reducers and fluid loss control agents [1]. Although the environmental standards that govern the choice of a fluid base and mud additives are complicated, the selection of the additives must take both technical and environmental concerns into account. The use of environmentally friendly mud and its additives in offshore and onshore operations can protect land ecosystems including terrestial enviroment and coastal regions as well as aquatic life. Water-based drilling fluids are recommended in places where oil-based drilling fluids have generally been employed due to environmental regulations[2]. Before being disposed of in the environment, drilling fluid additives and the complete drilling mud must undergo toxicity testing in oil and gas exploration and production [3]. Although the environmental effect of the drilling fluid and its additives plays a crucial role in determining the mud's uses, it is impossible to ignore the specific performance of the fluid. When using mud additives, it is crucial to confirm that they comply with all applicable technical and environmental standards.

Researchers have studied the effects of adding various fluid loss control agents to reduce the amount of fluid that is drilled into the formation[4–7]. For drilling boreholes with bottom-hole temperatures as high as 1500C, Amanullah [8] created some starch products that can be used as fluid loss additives. The drilling mud additives that are added determine a variety of drilling fluid functions. To replace diesel, which is not environmentally friendly, some additives are added. The drilling fluid's main purposes are to clean the bottom hole, cool and lubricate the bit and drill string, transport cuttings to the surface, reducing formation damage, maintain formation pressure, maintain hole integrity, assist in well

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A NOVEL IMAGE CRYPTOGRAPHY USING UES

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Abstract

In this paper, an image encryption method using Ultramodern Encryption Standard (UES) is envisioned. In this method, the encryption key is spawned by prolic series and then the original image is encrypted using the UES cryptosystem. This approach not just decreases the time complexity of the algorithm yet additionally adds the confusion and diffusion capacities, which makes the encrypted pictures developed by the UES approach resistant to the differential assaults. The key space of UES cryptosystem is large enough to fight the brute-force attacks. This approach is so subtle to the initial values and input picture so the little changes in these values can prompt critical changes in the encrypted picture. The model results depicted in the further sections ensures that slight changes in original image and key could result significant changes in the encrypted image and finally the original image cannot be accessed.

Keywords: UES, Cryptosystem, Encryption, Decryption, Image Encryption, Prolic Series

1. Introduction

The outright developed digitalization in recent days is playing a fundamental role in digital image transmission viz., legislature, medical, military, banking, finance sectors. In transferring such critical pictures across the digital transmission medium may sometimes get under the control of the intruder who can tamper its contents and may lead to declination of war, wrong treatment etc… in military and medical sectors respectively. Securing such significant images is possible through image encryption. Hence a high end image encryption technique with low time complexity is to be applied. In preference transmission of images between sender and receiver has to be done in short span of time, because irreparable damages may be happened, if the delay is more than the threshold.

A few assessment standards are to be considered in image encryption viz., "Histogram Analysis", "Adjacent Pixels Correlation Coefficient (APCC)", "Number of Pixels Change Rate (NPCR)" and "Unified Average Changing Intensity (UACI)". On the off chance that the upsides of these standards meet the ideal hope, this implies that the algorithm can resist the statistical and differential attacks [1]. Furthermore, an image encryption technique should have a major key space and high affectability to the underlying conditions to oppose the brute-force attacks [1].

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A Perception Based Image Watermarking Using DWT-SVD

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ABSTRACT

The hasty increase in tradition of personal computers, internet and digital multimedia technology leads to simply partaking of digital data/ media. However, accessibility of several image processing tools make easy to unlawful use of such data. Unlawful users/attackers can simply lead to advance of some techniques which can care for rational property rights of digital data/media. The combination of Discrete Wavelet Transform and Singular Value Decomposition is a modern digital watermarking method and has develop into trendy due to its robustness against different attacks. The proposed method is an image watermarking method which combines DWT-SVD based methods which guarantee robustness without escalating algorithm complication. The proposed method achieves toughness of the system on several set of attacks. Investigational outcomes validate that the projected method provides good picture eminence of watermarked images.

Key Words: Digital Image Watermarking, SVD, DWT, Robustness, Attacks.

1. INTRODUCTION

In the current day globalization, the ease of use of the internet and distinctive picture dispensation equipment opens as much as a better measure, the occasion of downloading a photo commencing the net, manipulating it with out the concurrence of the legal seller. For motive similar as this and several others, picture validation has developed into not only an active however additionally vital examine vicinity. Inserting watermarks in both alerts and descriptions can purpose deformation in them.

In common, a booming watermarking method must persuade the subsequent primary necessities.

1. *Imperceptibility*: the perceptual dissimilarity connecting the watermarked and the source picture have to be imperceptible to the creature observe, i.e., watermarks be supposed to not obstruct with the medium mortal cosseted.
2. *Robustness*: an unlawful person should no longer be capable to demolish the watermark not such as additionally building the image is insufficient, i.e., watermarks are presupposed to be study to gesture dispensation and considered attacks. In scrupulous, following frequent gesture dispensation techniques were purposeful to the watermarked image like filtering, re-sampling, cropping, scaling, virtual - analog, analog - digital conversions, compression, geometric transformation, rotation, and many others, they to still be quantifiable.

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Academic feedback system automation for an educational organization

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Abstract: For the educational improvements every college will require a student feedback system to assess the quality of the faculty members performance.This work focus on online feedback system to rate and analyse the faculty's concert. This online feedback system reduces the arduous work of physially examining the feddback pages of each and very student.The system also reduces the lumber of efforts and encumber of observance and maintaining the records on maual basis,which occupies more place in the room to keep those records as well as difficult in maintaining those records.Drawback of the manual feedback system is the students will get fear if the faculty came to know about the report given by the students. To overcome these sort of issues this online system will provide safety and privacy for the students to give thier feedback and is not mandatory to give the feedback by showing his physcal presence to the faculty of the admin instead they can directly access the online feedback link directly from their mobile or Laptop to enter the feedback for the faculty members. Experimental results shows that the online system developed for educational system provides easy way to assess the faculty members as well as other activities which have been taken inside the campus through the feedback received from the students on time to time basis without delay.Instead of spending so much paper based materials and setting the questions to be asked in the for of queires and collecting it from the students and doing analysis from that which leads to a tedious process.Keeping all these drawbacks this online feedback system has been developed to acccess this system anywhere and the report has been generated immediately based on the faculty name wise as well as the system will be used for taking feedback from the participants for the various events happening within the campus such as workshop,FDP,Conference etc..

Keywords: Faculty performance, online feedback system, students feedback, educational system, less paper work.

1. Introduction

At the present time , educational Institutions are paying growing concentration to the views of student's on the participation in knowledge and coaching from beginning to end reviews or feedbacks .This web based application provides a base for conducting feedback through online for college students to know the performance of the faculty as well as to the participants participated in various events conducted like FDPs,Conference,Workshop etc..In educational system at pesent scenario online interaction is very popular for academic domain.As the online classes are growing popular we need to identfy a system which is flexible, easy and accurate to give analysis reports.Taking into consideration of all educational practices an integrated online academic feedback system has been developed to evaluate the performance of the faculty members through students by giving the ranking based on the queires given in the ssytem the students will give their ranking based on the attributes mentioned.Once the student has attempted all the question he will submit his feedback with the system.

The assessment is based on students' responses in SUFO, which assessed professors' abilities based on professionalism and teaching approaches. The findings of this exploratory study comparing the coaching eminence of experienced and inexperienced lecturers are given. Student evaluation on the teaching quality of experienced and inexperienced professors is equivocal, while equal types of lecturers received low and high ratings from students[1]. It is critical for teachers and students to communicate effectively in order to succeed in any teaching programme. Student feedback assists teachers in improving their performance and conduct. The semantic web (SW) is a gifted tool for data retrieval and selection. For obtaining relevant information from web data, many web mining techniques are applied. The major goal of this research is to extract knowledge from student comments, which may be accomplished by using Sparql inquiry in Ontology. This information can be expressed in a significant way. The webbased student feedback system is a web-based feedback collection structure for students that allows for the automated creation of input from students.

The present procedure followed by the educational institution is paper based.Feedback form has been distributed to the students to fill the form which consists of certain attributes which should be selected by the students by tick marking.Once the form has been submitted it will be collected and analysis will be made on by go throughing the filled form submitted by the students.After analysis the report has been submitted to the principal for necessary action to the faculty members whose performance was not up to the mark.But acessing the report based on manual is time taking process and the report given by the students also

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Chapter 7
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Social Media Enhances the Happiness Levels of Various Age Groups in Society: An Empirical Study

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ABSTRACT

Social media is unavoidable in today's modern era. Most businesses and organizations have their existence virtually through these Social Networking Websites. It is the modern way of communication. The purpose of communication may vary but people use it for entertainment and as an engaging activity. Happiness is the major motto of human life. Every human being is in quest for happiness. Social media now provides another path in the search for happiness. In the present study it is brought forth the impact of social media on the overall happiness quotient of a person. It is seen that majority of the users feel satisfied, contented, and happy using social media. It is helping in filling relationship gaps also. It is the modern way of connecting people and has a lot of advantages to its credit but with a lot of negative impact on the society.

Keywords: Social media; happiness; satisfaction; entertainment; positive emotions; negative emotions.

1. INTRODUCTION

Social media is unavoidable in today's modern era. Most businesses and organizations have their existence virtually through these Social Networking Websites. It is the modern way of communication. The purpose of communication may vary mainly used for entertainment and as an engaging activity.

Web sites that allow social interaction are considered as social media sites, including social networking sites such as Facebook, Whatsapp, MySpace,

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Voice Recognition System Through Machine Learning

Sindhu B, B Sujatha

Abstract: Human voice recognition by computers has been ever developing area since 1952. It is challenging task for a computer to understand and act according to human voice rather than to commands or programs. The reason is that no two human's voice or style or pitch will be similar and every word is not pronounced by everyone in a similar fashion. Background noises and disturbances may confuse the system. The voice or accent of the same person may change according to the user's mood, situation, time etc. despite of all these challenges, voice recognition and speech to text conversion has reached a successful stage. Voice processing technology deserves still more research. As a tip of iceberg of this research we contribute our work on this are and we propose a new method i.e., VRSML (Voice Recognition System through Machine Learning) mainly focuses on Speech to text conversion, then analyzing the text extracted from speech in the form of tokens through Machine Learning. After analyzing the derived text, reports are created in textual as well graphical format to represent the vocabulary levels used in that speech. As Supervised learning algorithm from Machine Learning is employed to classify the tokens derived from text, the reports will be more accurate and will be generated faster.

Keywords : Machine Learning, Speech Recognition, Speech to text conversion, Text analysis, Vocabulary

I. INTRODUCTION

Voice-recognition software programmes work by analysing sounds and changing them to text. They additionally use information of how English is typically spoken to come to a decision what the speaker most likely spoke. Once properly established, the systems ought to recognise around ninety fifth of what's aforementioned if you speak clearly. Many programmes are on the market that offers voice recognition. These systems have principally been designed for Windows operating systems.

Speech is the primary mode of communication between individuals.

Speech recognition, generation of speech waveforms, has been facing least development for many decades [1]. Such speech contains lots of information. Most prominent and common mode of information transfer is through speech. In this system we are going to extract text from the speech and then vocabulary from that text to analyse the user's vocabulary skill set.

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II. LITERATURE SURVEY

Automatic speech Recognition is a method by that a PC takes a speech signal and converts it into words [2]. It is the method by which a PC acknowledges what a person said. Keyboard, though a standard medium, is not terribly convenient, as it needs a bound quantity of talent for effective usage .A mouse on the different hand needs a sensible hand eye co-ordination. Physically challenged individuals notice PC tough to use. Partly blind individuals notice reading from a monitor tough. All these constraints have to be eliminated. Speech interface facilitate us to tackle these issues. The objective is to entice human voice during a electronic computer and decipher it into corresponding text. Speech recognition will be outlined as the method of changing an acoustic signal, captured by a electro-acoustic transducer (microphone) or a telephone, to a group of words. When two individuals speak to one another, they each acknowledge the words and will be able to understand the meaning behind them. Computers, on the opposite hand, are solely capable of the initial thing: they can only acknowledge individual words and phrases; however they don't extremely perceive speech within the same means as humans do. PC acknowledges the command and software system tells the PC what to try to once that command is recognized [3].

Big data refers to information volumes within an extent of Exabyte (10^{18} B) and on the far side. Such volumes exceed the capability of current on-line storage and process systems. With characteristics like volume, velocity and variety massive information throws challenges to the normal IT sector. Computer aided innovation, real time information analytics, customer-centric business intelligence; trade wide higher cognitive process and transparency are potential blessings, to say few, of huge information. There are several problems with massive information that warrant quality assessment strategies. The problems are touching on storage and transport, management, and process. This paper throws lightweight into this state of quality problems associated with massive information. It provides valuable insights that may be accustomed leverage massive information science activities. [13] Big data and its analysis are at the middle of contemporary science and business. These information are generated from on-line transactions, emails, videos, audios, images, click streams, logs, posts, search queries, health records, social networking interactions, science information, sensors and mobile phones and their applications [4][5]. They are hold on in databases grow massively and become troublesome to capture, form, store, manage, share,

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E-O DFA: A Novel Finite Automata that recognizes Even or Odd numbers

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ABSTRACT: The theory of automata and its computation is exemplified as calculation by means of three essential theoretical machines namely "Finite Automata", "Pushdown Automata" and "Turing Machine". This manuscript proposes a sketch of "Deterministic Finite Automata" that recognizes the Even or Odd numbers when represented in binary form and the suitable validations were also presented.

KEYWORDS: Finite Automata, Even number, Odd numbers.

I. FOREWORD

Formal way of Automata Theory can be considered as computation via the theoretical machines. "Finite Automata" is one among them and is spoken to as a five tuple machine 'M'.

A DFA M is a 5-tuple $M = (Q, \Sigma, \delta, q_0, F)$, where:
Q is the finite set of states
Σ is the alphabet (that is, a finite set of symbols)
$\delta \in (Q \times \Sigma \to Q)$ is the transition function
$q_0 \in Q$ is the start state
$F \subseteq Q$ is the set of accepting states

Fig. 1. DFA M with its 5 Tuples

1.1. Even numbers:

Any Integer (never a fraction) that can be divided exactly by 2, said as even number. In other words the integer I is said be an even iff "I mod 2 == 0".

Examples: A set representing even numbers is E = {2,4,6,8.....2n|n≥1}

Representation of even numbers (considered at random) in binary is as follows

From the data available in table 1, it is observed that all the binary representations of corresponding even numbers are ending with 'zero' i.e., LSB. As per Automata Theory, the language for the even numbers can be assigned as

L={0,00,10,000,010,100,110,0000,0010,0100,0110,1000,1010,1100,1110,....} and the subsequent regular expression is designated as (0+1)*0

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Data Security using Efficient Cryptosystem

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Abstract:
Data is a tactical resource. Information transactions across the world have become inextricably interwoven. Providing security to that data is one of the primary aspects so as to protect from unauthorized disclosure and modification. A rigorous search made us to consider cryptography algorithms as the principle means of providing the data security. As numerous cryptographic algorithms exist but each of them has their own solid and frail focuses in terms of complexities. Keeping in mind the end goal to develop a low complex algorithm we have proposed a new symmetric stream cipher in this research article and named as "Random Prime Key - RPK" Algorithm. The strength of this algorithm has been analyzed over differential cryptanalysis and suitable criteria in order to ensure low complexity and high security.

Keywords: *Cryptography, Prime Number, Encryption ,Decryption, Data Security, Authentication.*

I. INTRODUCTION

The info or data transferring from transmitter to recipient with data auspices is becoming very tough nowadays. To overcome the data security problems the two most well-known techniques are encryption and decryption respectively. The encryption is such a process that is based upon converting normal text to unintelligible text and the same the other way around i.e changing or converting unintelligible text back to the correct message or normal text by utilizing the decryption method. We have proposed an efficacious cryptographic algorithm that is used for data protection. The intention is to overcome the data security problems by using a cryptographic algorithm for encryption and decryption, and also we use stream of symmetric keys for encryption and decryption methods.

1.1CRYPTOGRAPHY

Cryptography is a proficiency technique of ensuring security to data and communications through the utilization of codes so that only those persons for whom the information is allocated can understand it and process it. The prefix "crypt" refers to "hidden" and suffix grapy refers to "writing". In Cryptography the functional techniques which are used to defend data are attained from mathematical concepts and a set of rule-based calculations known as algorithms to convert the text that makes it tough to decipher it. These algorithms are used for cryptographic key generation, digitized signing, verification to secure data privacy, web browsing on the internet and to protect surreptitious trading such as credit and debit card.Where the cryptography plays a vital role ? Cryptography is the acquisition of using mathematics for encrypting and decrypting information, which refers to putting into or decrypting from a mathematical terminology. It is the cognitive operation of encrypting and decrypting the message. The encryption is a typical process of changing legible text to unreadable text in a similar way changing unreadable text back to legible text by using the decryption method.

1.2 CLASSIFICATION OF CRYPTOGRAPHY

SYMMETRIC KEY CRYPTOGRAPHY

It is an encryption scheme where the transmitter, as well as recipient of data, use a single mutual key to encrypt and decrypt textual data. Symmetric Key Systems are swifter and simplest but the trouble is that the transmitter and recipient have to interchange

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Research Article

A Privacy Preserving and Efficient Randomness Routing in Adhoc Wireless Network

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Article History: Received: 10 November 2020; Revised 12 January 2021 Accepted: 27 January 2021; Published online: 5 April 2021

Abstract: Now a day's automatic key establishment of any two devices in the network is placed an important role and generation of key is used for public key based algorithm. By using public key based algorithm we can automatically generated secret key any two devices in the network. So that by performing this process we can randomly generate secret key. In the ad hoc networks another concepts is routing from source node to destination node. The generation of routing process can be done by randomly and performing this process we can improve the efficiency in the routing. In this paper we are implementing random routing of secure data transmission protocol for generating routing and provide privacy of transferred message. By implementing this protocol we can provide random routing process for transferring message. Before transferring message the server will randomly generate routing for source node to destination node. After that the source node will send data to destination node. Before transferring message or data the source node will encrypt and send the cipher format data to destination node. The destination node will retrieve cipher format data and perform the decryption process. After completion of decryption process the destination node will get original message. By implementing those concepts we can improve the efficiency for generating routing and also provide security of transferring message.

Keywords: Dynamic Source Routing, Security, Secret Key Establishment, Common Randomness.

1. Introduction

An ad hoc network is a collection of hundreds mobiles and low power mobile nodes connected by wireless links.[1] The nodes in mobile adhoc network was not have a centralized mechanism. In the wireless network each node act as router to forward data to other node in the network. By transferring data through MANET is a self-configuring network to connect by wireless links with no access point. In the adhoc network each mobile device is autonomous. By implementing adhoc network mobile devices are free to move and organize themselves. Each Node in the MANET share the wireless medium and the topology

of the network dynamically The advancements in wireless communication and the mobile ad hoc network where two or more mobile nodes can form a temporary network without need of any existing network infrastructure. The implementation of proposed work helps to improve the privacy of transferred data and to reduce the packet loss and packet delay. The research of secret common randomness proposes an efficient routing strategy and also provide secure of data. . By implementing this approach will increase the reliability of data transmission. The multipath routing protocols are used to reduce the routing overhead, delay and to increase the data rate. By providing routing protocols to discover the paths every time when it is required to communicate with other nodes.

By implementing proposed system to provide more efficiency in the routing process and also improve the secret key generation between communication nodes. The proposed work helps to improve the throughput of transferred data and also reduce the data loss in the network. By implementing this approach we can also increases the packet delivery ratio and also increase the reliability of data transmission. To implementing the multipath routing protocols are used to create different routing each time and to overcome the route discovery overhead. In this paper we are proposed different routing mechanism and also provide better cryptography technique for security of data. So that by implementing cryptography to provide more security and also overcome the loss the data in the adhoc network. Before transferring data from source node to destination node the server will generate random shortest routing protocol for communicating each other.

Mobile adhoc network is used establishes secret common randomness between two or multiple devices in a network. By implementing this routing process it provide secure communication nodes. [3] In this paper we can also implemented one more concepts is key establishment, that overcome the problem of symmetric and also each user will generate its own secret key. So that the communicate nodes only knows those key and other nodes not known other keys. By provide this process we can reduce single operation for entire nodes. After that

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Research Article

A Privacy Preserving and Efficient Randomness Routing in Adhoc Wireless Network

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Self-Healing of the Body: The Three Basic Key Factors of Self Healing

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Abstract— Human Body has the amazing capability to heal itself but at times it needs assistance which is provided in the form of adequate nutrition, rest and medications. In this paper all the possibilities of assistance which a human being can provide externally for the self-healing of a human body is emphasized. There are some factors which are physical but many others are psychological as well. Most of the healing activity performed by body is involuntary and autonomic. Medications are mostly required when due to varied factors the self-healing is not sufficient for the body to recover. The objective behind this work is to bring awareness that human body has the capacity to heal itself. Due to lack of knowledge and ignorance people resort to all types of medications for small problems which can be handled by some lifestyle changes. There are numerous health workers working inside a human body who take care of the healing and well being. This paper tells about the three basic factors - food, sleep and exercise. Most of the health problems can be rectified if a person takes care of these factors during ailments.

KEYWORDS: Recovery, self-healing, exercise, calorie, vitamin, protein, carbohydrate

INTRODUCTION

"Body knows to heal itself". It seems to be crazy but it is truth. Most of the times it heals but sometimes it may need help. Body has an amazing ability to repair itself after serious illness or injury. Disease generally occurs when the body is abused or deprived of basic requirements to keep it healthy over extended periods[7].

A lot of work is carried out in the area which is popularly known as Complementary or alternative medicine (CAM).It deals with treatments without medication or treatment with natural ingredients. CAM is used by 25%-50% of the general population of industrialized nations[1-2] The reasons for CAM's present popularity most certainly are complex. They are related to the social and cultural context[3].

Self-Healing is the unique discovery of Meir Schneider. He cured himself of congenital blindness. His book teaches how one should attend to their body, to respond to its needs and demands, to unlock its unused potential. He suggested in his

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SIE: A Novel Cryptosystem to Secure Confidential Images

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ABSTRACT

Image encryption may be defined as the process of encoding confidential image(s) with the help of an encryption algorithm in such a way that it is inaccessible to unauthorized users. While transferring such images across the social networksor its applications, it is necessary to have a highly secured cryptosystem. Though several encryption techniques are publicly available, each of them has their own strong and fragile focuses. This paper depicts the newly proposed cryptosystem named as Secured Image Encryption with an acronym SIE. The input image undergoes series of operations to get converted into its encoded form. The model results regarding histogram and correlation analysis of encrypted as well original images illustrated in the further sections are evident that the proposed cryptosystem is large enough to protect the encrypted image.

1.INTRODUCTION

We are living in the digital information age where digital objects viz., photos, audio, documents are processed by digitization.[11In transferring such critical pictures across the network, may sometimes get into the hands of unauthorized personal which may lead to financial or political loss. Therefore, new security research is in order of the day. Image encryption is one of the most secure ways to protect your images.[12] The encryption of the transmitted data is converted to unknown content using some private key. Not only does it secures the image but also withstand against the cryptographic attacks.

2. Literature Survey

[1] Over the last few decades, data has become progressively important in many aspects of human life. Data has grown exponentially in recent years as a result of the implementation of new applications. Cloud computing is a technology that permits us to store massive volumes of data in the cloud. This research proposes a novel lightweight cryptographic technique that can be used to safeguard cloud computing applications and promote data security. The algorithm is a 16-byte (128-bit) block cipher that encrypts data with a 16-byte (128-bit) key. Shannon's theory of diffusion and confusion is integrated into this algorithm.

[2] This white paper focuses primarily on the various encryption algorithms used to encrypt and decrypt images in the field of image security. As information technology becomes more widespread, security has become a major concern. . Cryptography refers to the study of aspects related to information security mathematical techniques, such as data confidentiality, data integrity, and data authentication.

[3] In particular, this paper focuses on the exclusive form of image encryption and decryption strategies. In addition, As virtual strategies for transferring and storing photos increase, protecting the confidentiality, integrity,

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Density Based Smart Traffic Control System Using Machine Learning

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ABSTRACT

Density based smart traffic control system, is to control or automate green traffic signal allotment time based on congestion available at road side using canny edge detection algorithm. This technique relies on uploading current traffic image to the application and application will extract the edges from images, if there is more traffic then there will be more number of edges with white color and if uploaded image contains less traffic, then it will have less number of white color edges. Empty edges will have black color with value 0. By counting the number of nonzero white pixels, the time is allocated to the green signal. If less traffic is there then green signal time will be less otherwise green signal allocation time will be more.

KEYWORDS: Density based Traffic Control,Edge Detection, Image Processing in Traffic,Control,White Pixel Count

1.INTRODUCTION

Overcrowding is one of the country's top modern-day crises throughout each major city. According to a subsequent World Bank study, the typical car speed in Dhaka has lowered from 21 km/h to 7 km/h in the last ten years [1]. According to intermetropolitan science, traffic congestion reduces regional competitiveness and redistributes economic activity by slowing county gross export earnings or halting cosmopolitan economic growth [2]. As the more vehicles enter the once highly congested system, there is an urgent need for a completely new traffic management system based on emerging technologies that maximizes the use of existing infrastructure. Because building new roads, flyovers, elevated expressways, and so on require extensive planning, large sums of money, and a lot of time; the emphasis should be on making better use of existing infrastructures. Collect traffic information. Some people find out the amount of pixels [3–6], while others count the number of vehicles. In gathering pertinent traffic data, these methods have yielded promising results. However, calculating the number of vehicles may yield incorrect results if the intra vehicular spacing is very small (two vehicles close to each other may be counted as one) and may fail to include tricycles or motor as vehicles, both of which are prevalent modes of transportation in South Asian countries.

2. EXISTING WORK

The edge detection technique is required to retrieve the necessary real - time traffic information from CCTV footage[14]. It is useful for separating important data from the image background. A variety of techniques can be used to detect edges. [15]They differ in noise reduction, detection sensitivity, accuracy, and other aspects. The most accredited operators are Prewitt [7],

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Crime Data Analysis using Machine Learning

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ABSTRACT

The evildoer cases in India are becoming quickly because of which assortment of examples forthcoming are furthermore stacking up. This constant extend in the criminal occasions is ending up intense to be marked and to be addressed. Perceiving the hoodlum practice examples of an area is fundamental to thwart it from working out. The wrongdoing fixing organizations can accomplish a higher work assuming they have a right thought about the example of evildoer activities that are happening in a particular region. This can be achieved via the utilization of work area concentrating via utilizing selective calculations to find the examples of the hooligan activities in an exceptional region. This paper utilizes wrongdoing insights set and predicts such violations in a particular area which helps in running up the arrangement of hoodlum cases and continue accordingly.This paper utilizes the measurements of past 18 years that is accumulated from in excess of a couple of relied upon sources. Information pre-handling is all around as essential as residual forecast, this paper utilized work choice, discarding invalid qualities and name encoding to simple and support the information. This query gives a climate accommodating processing gadget inclining life sized model for anticipating the ensuing criminal case.

1.INTRODUCTION

As of now, the hoodlum cases that are forthcoming in India are quickly developing with the wide assortment of violations committed are expanding. To cure a case dependent absolutely on a particular records there should be a careful examination and assessment that will be performed inside. With the amount of wrongdoing measurements that is current in India by and by the assessment and choice creation of these hoodlum occurrences is excessively hard for the authorities. Distinguishing this an overwhelming issue this paper focuses on fostering a solution for the choice creation of wrongdoing that is perpetrated. AI is the part of science the spot PC frameworks decide aside from human mediation. In current occasions Machine Learning is being utilized in excess of a couple of spaces one of the instances of such cases is mechanized or self-driving vehicles. By Machine Learning calculations there is a way the spot we can anticipate sure results dependent absolutely on our bits of feedbacks offered and outfit a response to fixing wrongdoing examples in India. The two successive sorts of forecast techniques are characterization and relapse. This wrongdoing insights forecast is a region the spot grouping is applied. Arrangement is an administered expectation approach and it has been utilized in a scope of areas like determining stock, restorative region, etc.The most significant goal of this paper is to ponder onconsideration a few calculations which can be utilized to foresee and examine the wrongdoing realities and improve the exactness of these designs through data handling to procure higher outcomes. The reason is to train the expected life sized model to anticipate the records the utilization of the instructing measurements

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Blood Bank App Management Using Android Application

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Abstract: ***Blood donations have helped patients with life-threatening diseases and live longer with better quality of life. Blood donations also support many complex medical and surgical procedures as they also play an essential life-saving role in caring for children and mothers, especially during times of natural or man-made emergencies around the world. This blood bank app is based on Android mobile app framework i.e., Flutter, a Google development framework which is a open-source mobile app that can be developed for both IOS and Android devices. To make a blood bank more accessible to all mobile users. An app can also help people in need of blood by providing details and searching for the donor. If there are no donors who have the same group and within their own city, they can access addresses with contact phone numbers. people in big cities. The main goal of this project is to create a suitable and complete system that will provide a solution for managing blood banks for both donors and patients. Design an Android application for blood banks. Create a blood donation system by providing a safe donation process. This application aims to design, develop, and implement an online blood bank management system and allows you to manage your blood donor information.***

Keywords: Blood Bank, Android, Flutter, Firebase, Blood Donation.

I. INTRODUCTION

Blood is transfused to replace red blood cells that carry oxygen in a variety of situations, including necessary transfusion blood loss due to bleeding, surgery for any medical procedure, and medical conditions that prevent the body from producing new blood cells, such as anemia, kidney disease, cancer, chemotherapy, and chronic disease. Donor blood and blood bank products save millions of lives every year. Patients with life-threatening illnesses have benefited from blood donation, living longer and with a better quality of life. Blood donation aids numerous sophisticated medical and surgical operations, as well as playing a vital role in child and maternal care, particularly during natural disasters and man-made emergencies around the world. Everyone's most popular misperception is that donating blood will cause them to pass out or make them feel uncomfortable. After a blood donation, nothing happens. Despite substantial research, there has yet to be a viable equivalent for blood and blood components. Donated blood or a blood bag is an important part of illness management. It has shown to be a life-saving notion for people who have lost a lot of blood due to accidents, hemorrhage, or surgery.

II. LITERATURE REVIEW

Kumar, R., Singh, S., and Ragavi, V.A. (2017), analysts, help manage donor records and facilitate the handling and sharing of blood supplies in different parts of the country. I have created a web-based blood manager. The framework created by not only met the needs of banks but was also adaptable and versatile. Almost all blood donations and associated records were made physically, so I stuck to that line of reasoning. Following the blood donation training routine was previously difficult and modern and was in fact underpinned by many facts. In addition, analysts say that manual frameworks are error-intensive, labour-intensive, statistically reliable, and time-consuming to recover data and develop assessments. He pointed out that he could spend a lot of time on it. What happens is much less accurate. Meanwhile, research scientists Vikas Kulshreshtha and Dr. Sharad Maheshwari highlighted the benefits of the latest web-based system for the blood banks. The area of the blood donation facility is specially adjusted for the amount of blood and blood products. The term "blood bank" generally refers to the area of core healing labs where blood android utilities are tested, and android utilities are tested to reduce the risk of blood transfusions. A large cooler keeps these samples at a constant temperature and is always available. The centralized blood donation data framework provides Android software with the ability to access giveaway / donor files collected by country-specific components. This allows you to fully explore the impact and implementation of the pink blood banking application, as well as quantifiable and verifiable club goals. They productively investigate who needs blood, based on in their city, as soon as expected, depending on the situation. Dove Press article on "Android-based blood bank information retrieval system" in the following journal: "Blood Medicine Journal". This research paper solves the problem of improving web-based and Android-based blood bank information retrieval systems. The web utility uses to replace blood information accessible to many blood bank equipment directors with a mobile utility with a search engine used to search blood resources from registered blood banks.

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Discovery of Ranking Fraud for Mobile Applications

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***Abstract*—** Ranking fraud in the mobile App market refers to fraudulent or misleading tricks which have a purpose of bumping up the Apps in the status list. Indeed, it becomes more and more frequent for App developers to use shady means, such as inflating their Apps' sales or posting phony App ratings, to commit ranking fraud. While the importance of preventing ranking fraud has been widely recognized, there is limited understanding and research in this area. To this end, in this paper, this provides a holistic view of ranking fraud and proposes a ranking fraud detection system for mobile Apps. Expressly, we first propose to accurately locate the ranking fraud by mining the active periods, namely leading sessions, of mobile Apps. Such leading sessions can be leveraged for detecting the local anomaly instead of global anomaly of App rankings. Furthermore, this investigate three types of evidences, i.e., ranking based evidences, rating based evidences and review based evidences, by modeling Apps' ranking, rating and review behaviors through statistical hypotheses tests. In addition, In this propose an optimization based aggregation method to integrate all the evidences for fraud detection. Finally, we evaluate the proposed system with real-world App data collected from the IOS App Store for a long time period. In the experiments, can validate the success of the planned system, and show the scalability of the detection algorithm as well as some regularity of ranking fraud activities.

***Keywords*—** Mobile Apps, ranking fraud detection, evidence aggregation, historical ranking records, rating and review.

I. INTRODUCTION

The number of mobile Apps has grown at a wonderful rate over the past few years. For example, as of the end of April 2013, there are more than 1.6 million Apps at Apple's App store and Google Play. To stimulate the development of mobile Apps, many App stores launched daily App leader boards, which display the chart rankings of most popular Apps. Indeed, the App leader board is one of the most important ways for promoting mobile Apps. A higher rank on the leader board usually leads to a huge number of downloads and million dollars in revenue. Therefore, App developers tend to explore various ways such as publicity campaigns to promote their Apps in order to have their Apps ranked as high as possible in such App leader boards. However, as a recent trend, instead of relying on traditional marketing solutions, under the trees App developer's alternative to some fraudulent means to purposely boost their Apps and eventually manipulate the chart rankings on an App store. This is usually implemented by using so called "bot farms" or "human water armies" to increase the App downloads ratings and reviews in a very short time. For example, an article from Venture Beat [1] reported that, when an App was promoted with the help of ranking manipulation, it could be propelled from number 1,800 to the top 25 in Apple's top free leader board and more than 50,000100,000 new users could be acquired within a couple of days. In fact, such ranking fraud raises great concerns to the mobile App business. For example, Apple has warned of fast down on App developers who commit ranking fraud [2] in the Apple's App store. In the literature, while there are some related work, such as web ranking spam detection [3], [4], online review spam detection , and mobile App recommendation the problem of detecting ranking fraud for mobile Apps is still under-explored. To fill this critical void, in this paper, propose to develop a ranking fraud detection system for mobile Apps. Along this line, purpose of identify several important challenges.

First, ranking fraud does not always happen in the whole life cycle of an App, so In this need to detect the time when fraud happens. Such challenge can be regarded as detecting the local anomaly instead of global anomaly of mobile Apps. Second, due to the huge number of mobile Apps, it is hard to manually label ranking fraud for each App, so it is important to have a scalable way to automatically detect ranking fraud without using any standard information. Finally, due to the dynamic nature of chart rankings, it is not easy to identify and confirm the evidences linked to ranking fraud, which motivates us to discover some understood fraud pattern of mobile Apps as evidences. Indeed, our careful observation reveals that mobile Apps are not always ranked high in the leaderboard, but only in some leading events, which form different leading sessions. Note that can will introduce both leading events and leading sessions in detail later. In other words, ranking fraud usually happens in these leading sessions. Therefore, detecting ranking fraud of mobile Apps is actually to detect ranking fraud within leading sessions of mobile Apps. Specifically, In this first propose a simple yet successful algorithm to identify the leading sessions of each App based on its historical ranking records. Then, with the study of Apps' ranking behaviors, this find that the fraudulent Apps often have different ranking patterns in each leading session compared with normal Apps. Thus, the purpose of characterize some fraud evidences from Apps' historical ranking records, and develop three functions to extract such ranking based fraud evidences. Nonetheless, the ranking based evidences can be affected by App developers' status and some legitimate marketing campaigns, such as "limited-time discount". As a result, it is not sufficient to only use ranking based evidences. Therefore, in this further propose two types of fraud evidences based on Apps' rating and review history, which reflect some difference patterns from Apps' historical rating and review records.

In addition, this develops an invalid evidence-aggregation method to integrate these three types of evidences for evaluating the standing of leading sessions from mobile Apps. Fig. 1 shows the framework of our ranking fraud detection system for mobile Apps. It is importance noting that all the evidences are extracted by modeling Apps' ranking, rating and review behaviors through statistical hypotheses tests. The proposed framework is scalable and can be extended with other domain generated evidences for ranking fraud finding. Finally, In this evaluate the proposed system with real world App data collected from the Apple's App store for a long time period, i.e., more than two years. Experimental results show the effectiveness of the proposed system, the scalability of the detection algorithm as well as some regularity of ranking fraud activities.

Overview: The rest of this paper is organized as follows. In Section 2, this introduces some preliminaries and how to mine leading sessions for mobile Apps. Section 3 presents how to

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RESEARCH PAPER

Research on Advanced Streaming Processing on Apache Spark

K.V.K.Sasikanth[1*], K.Samatha[2], N.Deshai[3], B.V.D.S.Sekhar[4] & S.Venkatramana[5]

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ABSTRACT

Today's digital world computations are tremendously difficult and they always demand essential requirements to significantly process and store datasets of enormous size for a wide variety of applications. Since the volume of digital world data is enormous, unstructured data are mostly generated at high velocity beyond limits and are doubled day by day. Over the last decade, many organizations have been facing major problems in handling and processing massive chunks of data, which could not be processed efficiently due to lack of enhancements on existing and conventional technologies. This paper addresses how to overcome these problems efficiently using the most recent and world primary powerful data processing tool, namely clean open-source Hadoop, one of its core components being Map Reduce that is subject to few performance issues. The objective of this paper is to address and overcome the limitations and weaknesses of Map Reduce with Apache Spark.

KEYWORDS: *Big data; Hadoop; HDFS; Map reduce; Apache spark; Processing.*

1. Introduction

Today's digital world has significantly enhanced emerging technologies, new mechanisms, techniques, and tools and media such as social networks that generate huge data whose size grows exponentially each year. The IDC research forecasts that the total volume of data could increase 50 times by 2020 and they are mostly driven by different types of sensors, medical equipment, banking, Twitter, Facebook, Google, etc. Ninety percent of the last-decade applications have generated unstructured data such as documents, mail, images, etc. Nearly three Twitter messages are generated per minute for 26,976 years [1]. In this regard, the overall number of servers running data storage worldwide could increase ten-fold during the next decade. Big data become hot topics in the present decade, which seems to be an enormous size, and a majority of the unstructured data can, typically, never be processed using conventional computational tools and methods in an efficient, scalable, cost-effective, and reliable manner. In the digital world, the term big data in the latest era is characterized by immensely structured, semi-unstructured data sets that are handled by conventional data processing tools and methods; however, they have insufficient and poor performance.

Big data are significantly supported to efficiently analyze in-depth concepts to facilitate better intelligent and strategic decision-making for the development of the organization. Big data are distinctly addressed in terms of six characteristics: V's volume, velocity, veracity, variety, value, variability, and validity [2].

2. Background Challenges

Major limitations of existing approaches result from the capacity to only process low-volume datasets, which could be hosted only by standardized servers of the database or until the data processor is limited. However, it is an exhausting environment to process such information using a single database capacity, especially for managing massive amounts of extensible data. Map Reduce needs a longer time to perform maps and reduce tasks, thereby raising the latency. Reducing data processing velocity and increasing delay in distributing and processing the large data are given in the following clusters in Map Reduce [3].

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RESEARCH PAPER

Effective Sentiment Analysis of Twitter with Apache Spark

K. V. K. Sasikanth[*1], K. Samatha[2], N. Deshai[3], B. V. D. S. Sekhar[4] & S. Venkatramana[5]

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ABSTRACT

Today's interconnected world generates a huge amount of digital data while millions of users share their opinions and feelings on various topics through popular applications such as social media, different micro blogging sites, and various review websites every day. Nowadays, applying sentiment analysis to Twitter data is regarded as a considerable problem, particularly for various organizations or companies who seek to know customers' feelings and opinions about their products and services. The nature, variety, and enormous size of the data make it considerably practical for several applications ranging from choice and decision making to product assessment. Tweets are being used to convey the sentiment of a tweeter on a specific topic. Those companies keep surveying millions of tweets on some kinds of subjects to evaluate actual opinions and know the customers' feelings. This paper aims to significantly collect, recognize, filter, reduce, and analyze all such relevant opinions, emotions, and feelings of people on different products or services which could be categorized into positive, negative, or neutral because such categorization improves sales growth of a company's products, films, etc. The Naïve Bayes classifier is the mainly utilized machine learning method for mining feelings from a large quantity of data, like twitter and other popular social networks, due to its higher accuracy rates. This study performs sentiment polarity analysis on Twitter data in a distributed environment, known as Apache Spark.

KEYWORDS: *Big Data; Machine Learning; SVM; Map Reduce Spark Framework; Naïve Bayes; Sentiment Analysis; Natural language processing.*

1. Introduction

Sentiment Analysis (SA) aims to recognize the relationships between words in different sentences relatively rather than simply finding words through a search engine. Nowadays, people easily extensively share their experiences, thoughts, opinions, and feelings through popular social networks and on different professional micro blogging platforms, specifically Twitter as the most fashionable platform [1]. Today, the digital world extremely dominates the spread of encapsulated news and different trending topics across the globe at a rapid velocity. Most popular micro blogging platforms, like Twitter which was established in 2006 by Jack Dorsey, Noah Glass, Biz Stone, and Evan Williams, have recently become more popular social media across the whole world.

Approximately 6,000 tweets are tweeted on average on Twitter each second, more than 350,000 tweet posts per minute, around 500 million tweets per day, and approximately 200 billion tweets every year. More than 321 million active users are using Twitter due to the widespread dominance and horizon of the Internet [2].

Twitter is known as the most popular micro blog that offers an amazing social group service and mainly supports customers while interacting through messages called "tweets". Tweets could be primarily restricted to 140 characters only; however, in 2017, this boundary was increased by two-fold to 280 for many languages except Chinese, Japanese, and Korean. While all subscribed customers could post, like, and re-tweet required tweets, but nonregistered customers can simply read them [3].

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RESEARCH PAPER

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RESEARCH ARTICLE | MAY 22 2023

Performance analysis of generating cartoon like images from realistic images using various cycle GAN techniques

Kanchi Ramya ; Dr. N. Leelavathy

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+ Author & Article Information
AIP Conference Proceedings 2492, 030089 (2023)
https://doi.org/10.1063/5.0117738

In this paper, we present performance study of cartoon-like picture generation from actual photos utilizing several GAN methods. The idea of cartooning is to create cartoonic representations of actual input pictures. Three picture white-box displays are produced: 1. Surface Depiction - It contains a smooth surface of cartoon images. 2. Structure Depiction - It refers to the small colour blocks and flat global information in the workflow style of celluloids: 3. Texture Depiction - In cartoon pictures it displays high-frequency texture, curves and features. The cartoonic image outcomes on supplied pictures are suggested by utilizing Generative Adversarial Network (GAN) methods. GAN frame is used to learn the extracted pictures and cartoonize the realistic images provided. These photos may be used for movie animations, fun activities, online avatars, social images, etc. These pictures are recommended if someone wants to publish genuine images to prevent the danger of profound counterfeits. The outcomes of both methods should be calibrated to determine the optimum technique.

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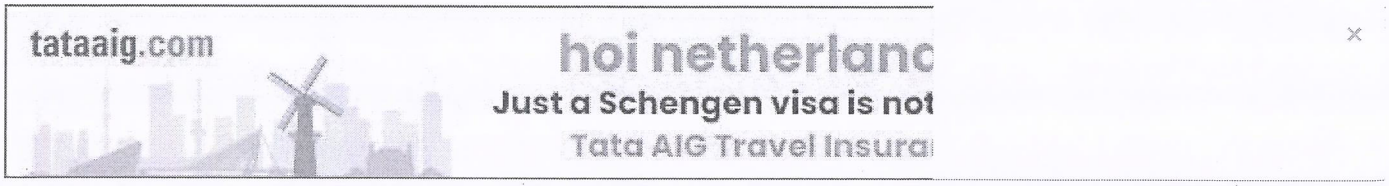

RESEARCH ARTICLE | MAY 22 2023

Handwritten character and numerical recognition using machine learning

K. V. Sasikanth ✉; S. V. Padmavathi; S. Durgasri;
Kouassi Alain Stephane; K. Vedavyas

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For handwritten characters there are difficulties like it differs from one writer to another, even when same person writes same character there is difference in shape, size and position of character. In the pass year it was very difficult to identify people mostly student handwriting, in fact some people naturally have very bad handwriting, so to help this people to be more understandable we decide to create an application which will help other people to understand them. Our application will translate the paper with best approach to get more than 90% accuracy in the field of Handwritten Character and Numerical Recognition. So we done more research on this model to get best accuracy.So,then our goal is to get 96% accuracy in future. The Application will be created on the platform such as Web and Mobile Android and IOS to make it available to a large number user.

Topics
Machine learning, **Students**

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RESEARCH ARTICLE | MAY 22 2023

Securing data with blockchain and AI

B. Sujatha ✉; K. Anas Faraz; N. Pranathi; Ch. B. R. Saranya; B. S. V. Chaitanya

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AIP Conference Proceedings 2492, 030030 (2023)

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Data is the integration of various AI (AI) algorithms for important features, the online details are scattered everywhere and controlled separately who do not believe in each other, and the use of information in complex Cyberspace. Too fast and hard to authorize or verify. Because of this, it is very difficult to enable data sharing on cyberspace of big data important, and as a matter-of-fact powerful AI. In this paper, we propose Secretary Network, I construction that will keep data safe, computer programming, and sharing within the Internet environment, aimed at a real cyber safe real estate data and thus improve AI with multiple data sources, with to combine three key elements: Block proprietary data sharing guarantee, which allows for reliable data sharing within a large area to make real big data; Creating a reliable cyberspace, based on AI a secure computer platform is used for mass production smart safety rules. A reliable way to exchange the purchase price Security, they provide the way participants can see economic rewards when releasing their data or service, which encourages the sharing of information and thus achieves better AI performance. Moreover, we talk standard usage of Sec Net and its another possible method, as well as analysis its effectiveness from the aspect of network security and economic revenue.

Topics

Computer programming, Public and occupational health and safety

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RESEARCH ARTICLE | MAY 22 2023

Twitter sentiment analysis based on ordinal regression

Sasikanth Kolanu ✉; Sharmada Kommabathula; Poojitha Peka; Sai Phaneendra Varma Gadiraju; Vivek Pathibandla

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Nowadays, Microblogging has become a well-liked communication mechanism among all the Internet surfers. Many people will share tweets/messages day to day on common sites, such as, Twitter or Facebook. The writers of those memorandum write about their lives, share their ideas on a diversity of subjects, and discusses about the current issues. As most of the people post about the products & services they've used, or express their views about politics and religious matters. Microblogging sites has become an important source of people's ideas & feelings. This type of data can be used effectively for research, or for a business. In current times, research on Twitter sentimental analysis, which explores the Twitter data (tweets) to bring out the user feelings about a topic, has grown quickly. A way to monitor emotions in tweets is by using Twitter Sentiment Analysis. Determining the sense of the tweets and listing them as good, bad, and neutral tweets is a big step in differentiating the process. The proposed program consists of collecting the tweets, then by using a method named feature-extraction which creates an effective feature to the collected data, and then undergoes to feature scoring and balancing. Algorithms such as multi-class logistic regression (SoftMax), Support Vector Regression (SVR), Decision Trees (DTs), and Random Forest (RF) are used to classify sensory analysis. In the actual implementation of the proposed program, we are making use of

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RESEARCH ARTICLE | MAY 22 2023

Plagiarism detection using KNN

D. Phani Kumar ✉; Ananda Tiwari; B. Shanti Priya; ... et. al

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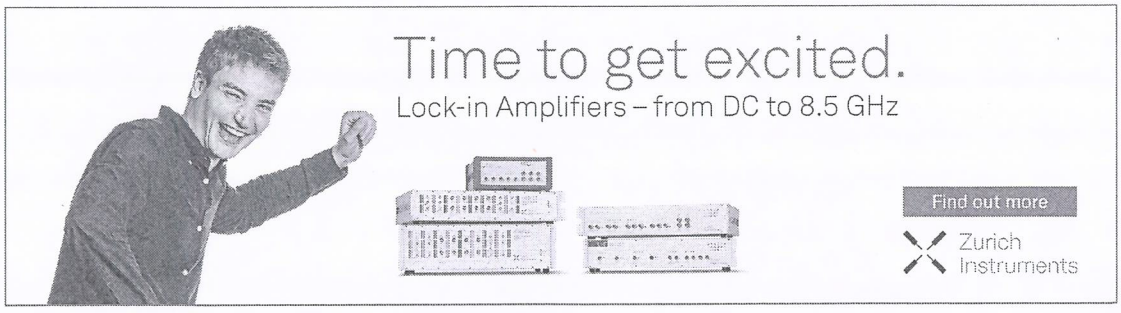

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RESEARCH ARTICLE | MAY 22 2023

Time series analysis of stock price movements: Insights from data mining using machine learning

N Santha Raju ✉; JMSV Ravi Kumar; B. Sujatha

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AIP Conference Proceedings 2492, 030062 (2023)

https://doi.org/10.1063/5.0117417

The effective prediction system in stock market helps to the traders and investors by providing the helpful information for the upcoming guidelines about stock market. Machine learning was the recent trend in prediction of stock market technologies, it makes the predictions depends on the values of stock market. To predict stock market indices, in this paper we have used recurrent neural network and long-short-term memory. We have analyzed various parameters used for stock market with the help of three algorithms which are random forest, support vector machine, regression models.

Topics

Data mining, Artificial neural networks, Machine learning, Regression analysis, Time series analysis

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RESEARCH ARTICLE | MAY 22 2023

Performance analysis of generating cartoon like images from realistic images using various cycle GAN techniques

Kanchi Ramya ; Dr. N. Leelavathy

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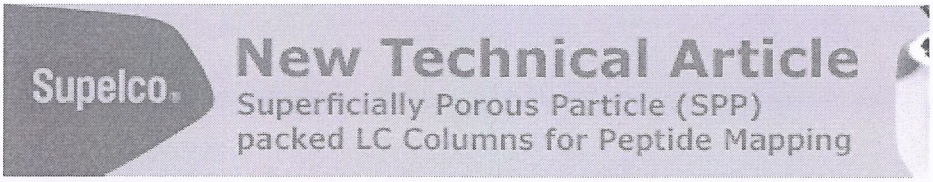

RESEARCH ARTICLE | MAY 22 2023

A deep learning approach to detect malaria

Prayaga Atchyut Pavan ; Sattibabu; J. M. S. V. Ravi Kumar

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The health agency has a lot of work on its hands, since malaria is the world's deadliest disease. For many years, a blood smear has been used to diagnose malaria. Microscopy done in the laboratory by skilled professionals for parasite-infected red blood cells among human people. This process is unsuccessful, and the diagnosis is based on the physician's skill and knowledge. For the test, a well-informed person is needed. Using learning algorithms, deep Malaria blood was examined. In the past, smears were used to determine a diagnosis; but, in the actual world, performance is what counts. This hasn't sufficed so far. We provide a new and creative way of thinking about this topic throughout this post This extremely sturdy machine learning model makes use of aA CNN that classifies and detects things on ancient research skinny blood smears with infected cells a group of magnifier slides ten-fold improvement in sensitivity within the cross-validation layer The technique through that the cell's parameter is understood during this study may be a cnn trained on 23,558 single-cell pictures. There square measure 3 sorts to decide on from. CNN models square measure contrasted by their accuracy and select ability. VGG-16 Frozen CNN, and VGG-16 Basic CNN square measure all terribly correct. I had already seen CNN. you'll be able to decide that model is that the most correct of the 3 models examined by scrutiny the exactness of 2 measurements.

Topics
Machine learning, Learning and learning models, Knowledge, Parasite, Blood cells

RESEARCH ARTICLE | MAY 22 2023

Anonymous account detection in social media using machine learning and natural language processing

Vegi Sivani ✉; D. Sattibabu; D. Phani Kumar

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AIP Conference Proceedings 2492, 030057 (2023)
https://doi.org/10.1063/5.0113583

Spammers have transformed significant person to person communication destinations into a stage for the spread of a tremendous measure of inadequate and maybe hazardous substance and data. Interpersonal interaction administrations are utilized by a great many people from one side of the planet to the other. The cooperation's that people have with web-based media destinations, for example, Twitter and Facebook significantly affect their everyday lives, for certain terrible repercussions now and again, also. For instance, Facebook has developed to get quite possibly the most lavishly utilized foundation ever, empowering an unsuitably immense measure of spam to be sent out of the site. Client accounts made by counterfeit clients send spontaneous tweets to different clients to advance organizations or sites, which influence genuine clients as well as motivation asset utilization to ascend too. The chance of spreading off base data to clients by means of the utilization of phony personalities has additionally expanded, possibly prompting the appropriation of unsafe things. Thus, the discovery of spammers and the ID of phony Twitter clients have as of late emerged as an unmistakable examination subject in the space of contemporary online interpersonal organizations (OSNs). All through this article, we will take a gander at the methods that are presently being used to distinguish spammers on the web-based media stage Twitter. Besides, a scientific categorization of Twitter spam

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RESEARCH ARTICLE | MAY 22 2023

Classification of genetic mutations for cancer treatment using machine learning approaches

Adduri Harika ✉; N. Leelavathy; B. Sujatha

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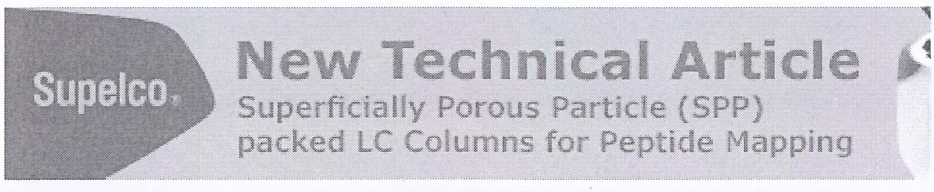
AIP Conference Proceedings 2492, 030056 (2023)

https://doi.org/10.1063/5.0113572

In the case of cancer, the development of the disease is caused by a mutation in the DNA sequence of the genome. When it comes to cancer development, the genetic changes that cause it are known as drivers, and when it comes to other, more neutral mutations, they are known as passengers. Genetic testing is becoming an increasingly essential component of personalized treatment, because to recent breakthroughs in DNA sequencing. Although progress has been made in this field, it has been sluggish owing to the large amount of manual labour that is still needed to fully comprehend genomics. The goal of this research is to automatically identify genetic variants that contribute to cancer tumour development (drivers) in the presence of neutral mutations that have no effect on the tumours in order to improve cancer treatment (passengers). We are requested to correctly differentiate between nine types of mutation effects caused by the genes under consideration using abstracts of medical papers that have been collected. We demonstrate that this job may be addressed without the need for substantial domain information to be included into the classifiers, and that basic NLP pipelines can function quite well in the suggested configuration.

Topics

Machine learning, Molecular genetics, Diseases and conditions, Genomics, DNA sequencing, Cancer treatment,



RESEARCH ARTICLE | MAY 22 2023

Object tracking from videos using python

P. Sri Ram Chandra ✉; Ch. Revathi; V. Teja Sri Lakshmi; D. Leela Nagendra

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AIP Conference Proceedings 2492, 030022 (2023)

https://doi.org/10.1063/5.0113968

The goal of the task is to identify the objects from recordings and webcam. Object recognizable proof can be used to recognize objects in the scene and choose and track their precise regions. This application comprises of two modules, those are 'Browse System videos' and 'Start Webcam Video Tracking'. Here we are utilizing Python and OPENCV module for identifying objects from recordings and webcam.

Browse System Videos: Utilizing this application module permit client to transfer any recordings from his framework and application will associate with that video and begin playing it, while playing assuming application distinguish any item, it will check the object surrounding with bounding boxes, while playing video on the off chance that client needs to quit following, he needs to squeeze 'q' key from console to quit playing video.

Start Webcam Video Tracking: Utilizing this application module partners itself with inbuilt system webcam and start video online, while electronic accepting application recognize any article, it will incorporate that item with jumping boxes, while playing press 'q' to stop the webcam streaming.

Topics

Programming languages

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RESEARCH ARTICLE | MAY 22 2023

Intelligent voice assistant application: An e-learning portal for visually impaired

P. Sri Ram Chandra ✉; P. Venkata Jyotshna; M. Madhuri; M. Sukhino Bhavanthu; L. Sudheer

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AIP Conference Proceedings 2492, 030032 (2023)

https://doi.org/10.1063/5.0113970

The visually impaired and blind folks face numerous challenges in their day to day life. The aim of the projected work is to implement associate degree application for purblind persons based on the automaton sensible phone. The speedy development of data technology has created access to mobile applications for visually impaired folks became troublesome. By victimization these type of apps User interaction can become terribly simple for Visually difficult students. This application saves time for the users to induce all notes, video update, notice, answer at one place within the style of audio files. the aim of this project is to create out there of interactive e-learning app for visually impaired folks. This android app is specially designed for Visually Challenged Students UN agency are looking on any person for facilitate. The Basic workflow of the system is that the scholars will login into the app and may question the applying as per their desires through voice commands or directions. The results for college kids queries and instruction for more are going to be displayed on the screen and conjointly the system speaks out them for college kids through voice assistant.

Topics

Students, Educational institutions, Learning and learning models, Educational aids

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RESEARCH ARTICLE | MAY 22 2023

Intelligent voice assistant application: An e-learning portal for visually impaired

P. Sri Ram Chandra ✉; P. Venkata Jyotshna; M. Madhuri; M. Sukhino Bhavanthu; L. Sudheer

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AIP Conference Proceedings 2492, 030032 (2023)

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Topics

Students, Educational institutions, Learning and learning models, Educational aids

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RESEARCH ARTICLE | MAY 22 2023

Feature extraction for classifying students based on their academic performance

Shaik Yacoob; S. Bhavani; S. Sai Sri Ram; A. Lakshmana Rao; G. Vineela

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AIP Conference Proceedings 2492, 030024 (2023)

https://doi.org/10.1063/5.0131088

In today's world of education, building tools to help students learn in a formal or online way is a major challenge. The first stages of using machine learning techniques are to enable those technologies that focus on predicting student achievement in terms of marks obtained. The downside to these methods is that they do not work very well in predicting successful students. The purpose of our efforts is twofold. To begin with, we are investigating whether underperforming students can be accurately predicted by restoring this function as a problem of binary separation. Second, in order to learn more about factors that may contribute to improper functioning, we have created a set of human translators that measure these factors. These features are taken from the University of Minnesota community center grades. We conducted research based on these factors to identify the different groups of students who were interested in determining their value.

Topics

Machine learning, Students, Learning and learning models, Educational assessment, Universities

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RESEARCH ARTICLE | MAY 22 2023

Use of ANN to detect fake profiles

Shaik Yacoob ✉; A. Divya; G. Supriya; M. Ashish; S. Chinna

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AIP Conference Proceedings 2492, 030034 (2023)

https://doi.org/10.1063/5.0131094

In this era, social life for everyone is connected to social networking sites (OSN). These sites have made drastic changes in the way we interact with people. Making friends and interacting with them and getting updated with their work, it has become easier. Along with their rapid growth, problems such as fake profiles, offline identity have also increased. A fake profile can be exploited to build an online relationship with the target person through online communication with the victim's friends.

Topics

Social networks

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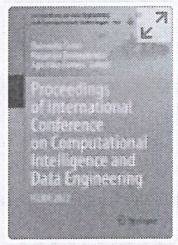

International Conference on Computational Intelligence and Data Engineering

ICCIDE 2022: **Proceedings of International Conference on Computational Intelligence and Data Engineering** pp 1–16

A Review of Deep Learning Methods in Automatic Facial Micro-expression Recognition

Lalasa Mukku & Jyothi Thomas

Conference paper | First Online: 18 June 2023

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RESEARCH ARTICLE | MAY 22 2023

Reading lip motion in noisy videos using deep learning concepts

N. Leelavathy ✉; S. Lohith; A. Jeswanthi; L. Ramya; N. Anjali

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AIP Conference Proceedings 2492, 030019 (2023)

https://doi.org/10.1063/5.0113189

Reading lips (i.e., extracting phonemes from lip visuals) can be difficult, especially in noisy videos. To solve this problem, we created a deep-learning algorithm to read lips. We opt a convolutional neural network on the video frames themselves, due to the success of CNNs as image classifiers in the past. In the end, we created a model that can identify the correct phoneme spoken 48% of the time by looking at only images, which is close to peak human performance. Here we present various methods to predict words and phrases from only video without any audio signal. We employ a VGGNet pre-trained on human faces of celebrities from IMDB and Google Images, and explore different ways of using it to handle these image sequences. The VGGNet is trained on images concatenated from multiple frames in each sequence, as well as used in conjunction with LSTMs for extracting temporal information. While the LSTM models fail to outperform other methods for a variety of reasons, the concatenated image model that uses nearest-neighbour interpolation performed well, achieving validation accuracy.

Topics

Artificial intelligence, Machine learning

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2nd National Conference on Computing, Electrical, Electronics and Sustainable Energy Systems (NCCEESES-2017), 6-7 July 2017
Organized by Department by EEE, Godavari Institute of Engineering and Technology, Rajahmundry

Generating Searchable Public-Key Cipher Texts with Hidden Structures for Fast Keyword Search

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Abstract— ***Present day's definition of protection of public-key finding encryption idea take find time linear with the total number of the cipher texts. This makes renewal from large-scale databases preventing. To eradicate this problem, this paper introduce finding Public-Key Cipher texts with Hidden Structures (SPCHS) for keyword find as quick as possible without losing definition protection of the encrypted keywords. In SPCHS, all keyword-finding cipher texts are efficient by private relations, and with the find trapdoor identical to a keyword, the minimal message of the relations is expose to a find algorithm as the advice to search all identical cipher texts effortlessly. We construct a SPCHS chart from scratch in which the cipher texts have a private star-like structure. We prove our chart to be definition protection in the Random Oracle (RO) model. The find complication of our chart is defenseless t on the actual number of the cipher texts involving the queried keyword, rather than the number of all cipher texts. Finally, we present a generic SPCHS construction from nameless identity-based encryption and collision-free full-identity malleable Identity-Based Key Encapsulation Mechanism (IBKEM) with anonymity. We illuminate two collision-free full-identity malleable IBKEM instances, which are semantically secure and anonymous, respectively, in the RO and standard models. The recent instance enables us to construct an SPCHS chart with semantic protection in the standard model.***

I. INTRODUCTION

Public-Key encryption with keyword find (PEKS), introduced by Boneh et al., has the asset has anyone who knows the receiver's public key can upload keyword-finding cipher texts to a server. The collector can agent the keyword search to the server. when the receiver wants to recover the files involving a specific keyword, he agent a keyword search trapdoor to the server; the server finds the encrypted files involving the queried keyword without expecting the original files
The authors of PEKS also presented definition protection against chosen keyword attacks (SSCKA) in the sense that the server cannot analyze the cipher texts
of the keywords of its select before aware the containing keyword search trapdoors.

II. RELATED WORK

Present definition protection PEKS chart take find time linear with number of cipher texts. This makes improve from large-scale databases excessive. Therefore, more efficient search performance is crucial for practically expand PEKS chart.

One of the outstanding works to advance the find over encrypted keywords in the public-key setting is deterministic encryption introduce by Bellare et al.

III. LITERATURE REVIEW

Bellare et al. focus on permissive find over encrypted keywords to be able as the find for unencrypted keywords, such that a cipher text corresponding a given keyword can be recovered in time involvement logarithmic in the total number of all cipher texts. However, deterministic encryption has two inherent drawbacks. First, keyword privacy can be approved only for keywords that are a priority hard to-guess by the second certain information of a message leaks surely via the cipher text of the keywords.

IV. PROBLEM DEFINITION

One of the outstanding works to advance the find over encrypted keywords in the public-key frame is deterministic encryption introduced by Bellare et al.
Bellare et al. focus on permissive find over encrypted keywords to be able as the find for unencrypted keywords, such that a cipher text corresponding a given keyword can be recover in time involvement logarithmic in the total number of all cipher texts. from a cryptographic overview, the present works fall into two kind, i.e., symmetric searchable encryption and public-key searchable encryption.

V. PROPOSED APPROCH

Present definition protection PEKS chart take time to all cipher texts. This makes retrieval from large-scale databases excessive. Therefore, more able find performance is crucial for practically deploying PEKS schemes.

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Special Issue from 2nd National Conference on Computing, Electrical, Electronics and Sustainable Energy Systems, 6th – 7th July 2017, Rajahmundry, India

Path PlanningTechnique to Reduce Computational Latency

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Midde Mounika Sai and Dr.B.Sujatha, "Path PlanningTechnique to Reduce Computational Latency", *International Journal for Modern Trends in Science and Technology*, Vol. 03, Special Issue 04, July 2017, pp. 91-98.

ABSTRACT

In mobile navigation administrations, on-road path designing could be a basic capacity that finds a course between a questioned begins area and a goal. While on streets, how arranging question may be issued due to component considers different things, for instance, a unexpected alter in driving course, surprising activity conditions, or lost of GPS signals. In these things, means arrangement ought to be conveyed in an auspicious manner. The requirement of opportunities is significantly all the tougher once an impressive range of means arrangement inquiries is submitted to the server, e.g., throughout prime hours. Because the interval is basic to consumer fulfillment with individual route administrations, it's an order for the server to effectively handle the overwhelming work of means arrangement demands. To address this issue, we tend to propose a framework, specifically, Path planning by Caching (PPC), that intends to answer in our own way arrangement inquiry effectively by reserving and reusing verifiably questioned ways that (questioned ways that in short). Not in the slightest degree like normal cache based mostly means arrangement frameworks wherever a reserved question is came simply when it coordinates wholly with another inquiry, PPC influences somewhat coordinatedquestioned ways that future to answer part(s) of the new inquiry. Accordingly, the server only must calculate the unequalled path segments, along these lines altogether decreasing the system work

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I. INTRODUCTION

Due to advances in huge information analytics, there's a growingneed for scalable parallel algorithms. These algorithmsencompass several domains as well as graph process,machine learning, and signal process. However, one of themost difficult algorithms lies in graph process. Graphalgorithms are better-known to exhibit low section, information dependencememory accesses, and high memory needs. Even theirparallel versions don't scale seamlessly, with bottlenecksstemming from study constraints, like cache effectsand on-chip network traffic. Path designing algorithms, suchas the celebrated Dijkstra's rule, fall within the domain ofgraph analytics, and exhibit similar problems. These algorithmsare given a graph containing several vertices, with someneighboring vertices to confirm property, and are taskedwith finding the shortest path from a given supply vertex to adestination vertex. Parallel implementations assign a collection ofvertices or neighboring vertices to threads, depending on theparallelization strategy. These methods naturally introduceinput dependence. Uncertainty in choosing the nextvertex to leap to, leads to low section for information accesses. Moreover, threads convergence onto identical neighboring vertex sequentializes procedures attributable to synchronization andcommunication. Partitioned off information structures and sharedvariables ping-pong inside on-chip caches, inflicting coherencebottlenecks. Of these mentioned problems create parallel

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Collision Tolerant and Collision Free Packet Scheduling for Underwater Acoustic Localization

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ABSTRACT

This article examines the joint downside of packet programming associate degreed self-localization in an underwater phonic detector network with every which way allotted nodes.Our goal is to cut rate the localization time, and to do so we consider two packet sending schemes, The required localization time is invent for these schemes, and thru analytical results and numerical examples their performances area unit shown to be minor on the circumstances.When the packet extent is short (as is the case for a localization packet), and the average credibility of packet-loss is not close to zero, its implementation involvement is lower than because in CTS, the anchors work apart. but it is shown to provide a better localization certainty. An iterative Gauss-Newton algorithm is engaged by each sensor node for self-localization, and the CramérRao lower bound is estimate as a benchmark.

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I. INTRODUCTION

After the emergence of autonomous underwater vehicles (AUVs) in the 70s, developments in computer systems and networking has Modern underwater networks are expected to handlethe sensor nodes measure various environmental parameters, and transfer the packets with other sensor nodes or address them to a fusion center. In many underwater applications, the sensed data has to be designated therefore, sensor nodes that search the environment and gather data have to know their position, Due to the demanding of underwater phonic.In contrast to underwater systems, sensor nodes in terrestrial wireless sensor networks (WSNs) can be equipped with a GPS module to determine location. however, cannot produce more than a few meters, and In addition, An underwater sensor node can resolve its position by calculating the time of flight (ToF) to several anchors with known regions, and performing multi alteration. Other approaches may be employed for self-localization, such as fingerprinting or angle of arrival estimation. All these approaches require packet transmission from anchors.

Many factors determine the accuracy of self-localization. Other than noise, the number of anchors, their certainty and relative position of the sensor node [8], propagation losses and fading also affect the localization accuracy. Some of these parameters can be regulate to improve the localization certainty, but others cannot.

Although an excellent deal of study exists on underwater localization algorithms, very little work has been done to see however the anchors ought to unfold their packets to the sensing element nodes, an underwater node examine the transponders for round-trip delay respect., and alternative anchors unfold their
packets during a given order once the reception of the beacon from the previous anchor.Joint node analysis and collaborative localization without the aid of GPS. The algorithm starts with a few anchors as primary seed nodes, and as it advance, suitable

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