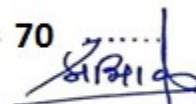


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Finite element analysis of tibia bone

Pratik S. Thakre, K.S. Zakiuddin, I.A. Khan and M.S. Faizan

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PDF

Abstract & Keywords



Tools



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Abstract

This research was directed towards a study of the lower limb of the human body through the 3D modelling and finite element analysis of the tibia. FEA is used to evaluate the stresses and displacements of human tibia bone under physiological loading. In this study, CT scan data of patients' tibia bone (healthy, broken tibia bone after one month and two months of surgery tibia bone) are used to develop 3D finite element models of the left proximal tibia bone, and average body weight applied on tibia bone. FEA is conducted to calculate the equivalent von Mises stress, maximum principal stress, total deformation and fatigue tool from the whole proximal tibia bone and comparing the results. These analysed results provide a great foundation for further studies of bone injury prevention, bone transplant model integrity and validity and subject-specific fracture mechanism as the results of three bones compared.

Keywords

tibia, fibula, stress analysis, material properties, displacement, modelling, simulation, finite element analysis, FEA, HyperMesh, embodi 3D

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Keywords

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ASSESSMENT OF PHYSICAL, FRICTIONAL AND AERODYNAMIC PROPERTIES OF CHAROLI (Buchanania Lanzas Spreng) NUT AS POTENTIALS FOR DEVELOPMENT OF PROCESSING MACHINES.

Source: Carpathian Journal of Food Science & Technology . 2021, Vol. 13 Issue 2, p174-191. 18p.

Author(s): Shelare, Sagar; Kumar, Ravinder; Khope, Pravin

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Advances in water sample collections with a drone – A review

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ABSTRACT

Drones, also known as unmanned aerial vehicles (UAVs) have been becoming more popular in a variety of industries in recent years, and their popularity is growing continually. These UAVs' rapid development and implementations offer an efficient solution and emerging possibilities for environmental monitoring. UAVs have become a common method for tracking complex environmental processes due to flight scheduling versatility, cost-effectiveness, and high spatial resolution. UAVs are being used in a variety of new applications. Cities all over the world are failing to combat water quality issues due to a shortage of technology capable of successfully supporting management actions. Water quality control and forecasting improvements in water characteristics necessitate the prompt storage of water samples. Drones have the ability to solve this problem. Drones have gained popularity among environmental researchers and water resources, but fewer attentions got for their ability for water sampling payloads. This paper aims to provide a systematic overview of recent contributions of drones with the capability of trapping water from bodies of water, such as drone-based sampling water payloads. The review's solutions are aimed at appealing to these limitations of drones to handle water samples, involving adapted drones with higher payload capacity, trying to simplify an arrest of more significant volumes of water, organizing fieldwork for operation outside visible sight, and integrating sustainable scientific investigative designs. It ends with discussing the problems and potential for possible exploration and applications concerning drone-based water sampling payloads.

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1. Introduction

The leading cause of future enhancement is sustainability [1]. It is the responsibility of today's youth to conserve and nurture the world for the sake of today's and future generations. Drones, like unmanned aerial vehicles (UAVs), have been used in several missions and applications [2,3]. Depending on the mission, these autonomous flying systems can hold a range of sensors, including acoustic, visual, environmental, and biological sensors [4]. The use of aerial vehicles for agricultural purposes dates back to the nineteenth century. Balloons were utilized for taking photographs for remote sensing reasons in 1860 [5]. Aerial cameras mounted on the breasts of pigeons were used for filming in 1903 [6]. Drones are believed to have originated from aerial torpedoes, were produced at the start of World War I [7,8]. Academic and business societies

around the world have paid increasing attention to the study and production of unmanned aerial vehicles in recent years [9,10]. Drones are usually categorized broadly based on their configurations depending on the given mission [10]. Fig. 1 shows the various applications of drones.

The monitoring of water quality is significant to various occasions. Its work is to characterize and notes the changes in the quality concerning time. The monitoring of water quality can also imply to identify particular surviving or growing problems of water quality. Pollutants due to stormwater might embody microorganisms, kittens, debris, fuels, and minerals. With the help of monitoring, prevention and solution can be conceded. Additionally, the monitoring of water permits verifies whether or not the project aims are satisfied concerning consistency among the rules and the execution of compelling pollution controller management methods [11].

The quality of water differs due to the wrong division of water transportation and contaminant store fields [12]. In India, many

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Establishment of mathematical model for minimization of human energy in a plastic moulding operation

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Plastic injection moulding

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Buckingham's pie theorem

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ABSTRACT

This article deals with the field data study and analysis to estimate and optimize human energy expenditure for the plastic injection moulding process. The article explains the formulation of a field data-based mathematical model for human energy expenditure. The data-based field model is proposed with optimized variables for reducing human energy consumption in various operations involved in the plastic injection moulding process, thereby increasing productivity. The independent variables influencing the phenomenon (Human Energy Consumption in Plastic Moulding Operation), such as anthropometric variables of workers, environmental variables, and workstation variables, are the part of this study. For this, research has been undertaken to formulate the model through dimensional analysis techniques, which is then accompanied by the analyses, including optimization and sensitivity. Buckingham's pi theorem (BPIT) is used to group the variables into pie terms in order to establish the mathematical model. Linear programming with Ms-solver is used to optimize and determine the optimized value of pie terms to minimize human energy.

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1. Introduction

Injection moulding is the most commonly used procedure for manufacturing plastic parts. Plastic is being used in approximately all kinds of applications [1], from household items to space exploration, transport to packaging, drugs to gadgets, structure construction to sports [2]. In general, injection moulding is a procedure that forms plastics into a required shape through heating the plastic and pressing this under pressure into the mould cavity [3]. The ideal form of the plastic is obtained by a chemical reaction in thermosetting or by chilling by thermoplastic [4].

As the plastic industry's product quality criteria have become more strict, determining the optimum injection moulding processing parameters for the production of new products and enhancing current quality products is becoming an active field of research [5].

Setting method variables and refining them are known as efficient methods to enhancing the consistency of moulded components while incurring no extra costs for mould repairs [6]. However, optimizing process variables is a diverse and complex challenge since it is dependent on several factors, including the moulding material, the mould and product design, and the moulding system [7].

The industry requires to achieve adequate productivity with good product quality [8]. However, due to various variables involved in the Plastic Moulding Process, it becomes difficult to achieve both at a time. Because productivity directly proportional to time [9] and for a quality product, one must require adequate work with great accuracy [10]. Human energy consumptions play a prominent role in both the aspect, i.e. productivity and quality.

Also, through literature survey [6-7] and visits to several plastic processing industries, it is observed that man & machine interaction is highly involved in the execution of plastic products. At various sections, the human energy expenditure seems to be more which could be saved and utilized for more appropriate work.

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Utilization of waste transformer oil as a fuel in diesel engine

Pramod N. Belkhode^a, Vinod N. Ganvir^b, Anand C. Shende^b, Sagar D. Shelare^{c,*}^a Department of General Engineering, Laxminarayan Institute of Technology, RTM Nagpur University, Nagpur 440033, India^b Department of Petrochemical Technology, Laxminarayan Institute of Technology, RTM Nagpur University, Nagpur 440033, India^c Department of Mechanical Engineering, Priyadarshini College of Engineering, RTM Nagpur University, Nagpur 440019, India

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ABSTRACT

The growing price of fossil oils, the gradual decline of petroleum supplies and the unsustainable emissions of motor vehicles led researchers to look for substitute fuel, such as waste lubricant oil and waste transformation oil (WTO). In power transformers, welding transformers, and electromotive systems, a significant volume of transformer oil is used as a coolant. The electrical transformer is an integral part of electrical power transmission and distribution equipment used in smaller, intermediate and larger electrical distribution stations. The efficiency and lifespan of an electrical transformer depend upon the transformer's efficient cooling and insulation. During the working of a transformer, transformer oil is exposed to electrical and thermal stress due to which it started to degrade after some time. Thus a huge amount of degraded transformer oil is rejected as waste. The paper details the utility of waste transformer oil by using simple batch distillation operation at atmospheric pressure by analyzing the physico-chemical properties of the product. The treated transformer oil is further tested in the diesel engine to examine fuel efficiency. Diesel engine runs were performed with various combinations of blends consists of diesel fuel and treated transformer oil. Results reveal that brake thermal efficiency of the blends found at 10%, 20%, 30% and 40% is 28.19%, 27.52%, 26.21% and 25.98% respectively. The brake specific fuel consumption of blends at 10%, 20%, 30% and 40% is 0.29 KJ/Kwhr, 0.30 KJ/Kwhr 0.31 KJ/Kwhr and 0.315 KJ/Kwhr respectively.

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1. Introduction

In recent days, alternative fuels have received considerable interest in terms of environmental friendliness [1]. In recent years, the diminishing of fossil fuels, increasing demand for transportation fuels, cost, and stringent environmental regulations encourage researchers to explore alternative energy sources [2,3]. There is insufficient petroleum reserve in the current period to satisfy the need for the petroleum commodity and it is thus important to make waste products as sources of oil [4]. Many of these potential renewable fuels were focused on engine use [5] and, since the growth of such fuels, authors have produced a range of techniques for maximizing their production [6]. For petroleum oils, waste transformer oil (WTO) may be an alternate source. The WTO has essential physicochemical characteristics and a portion of our demand can be met [7].

Diesel engines are primarily used for several ways, such as the power industries, agriculture, and automobile, due to the low specific fuel consumption, fuel economy, and a propensity to produce lower emission levels, excluding PM and NOx emissions [8–10]. High hikes in the cost of petroleum, rapid depletion of fossil fuels, and tight pollution limits enforced by the government each year render research questions of alternative energy sources such as biofuels, waste oils, and biomass for diesel engines [11].

In India, there is an immense amount of waste transformer oil which is refused every year. There is no need of this oil for any other reason [12]. Researchers used to power diesel engines using used oil from industry, including transformer oils, hydraulic oil, and brake fluids, have been obtained and washed, and used in many ways since the last decade [4]. So, after re-refining waste transformer oil can be an important source of energy to meet the demand for fuel in India. In welding transformers, power transformers, and electromotive systems, transformer oil is commonly used as a coolant [13]. The electrical transformer is an integral part of the electrical power transmission and distribution equipment

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ASSESSMENT OF PHYSICAL, FRICTIONAL AND AERODYNAMIC PROPERTIES OF CHAROLI (Buchanania Lanzas Spreng) NUT AS POTENTIALS FOR DEVELOPMENT OF PROCESSING MACHINES.

Source: Carpathian Journal of Food Science & Technology . 2021, Vol. 13 Issue 2, p174-191. 18p.

Author(s): Shelare, Sagar, Kumar, Ravinder, Khope, Pravin

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paper 7
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Advances in water sample collections with a drone – A review

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ABSTRACT

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3-2-1

Shielded metal arc welding of AISI 409M ferritic stainless steel: study on mechanical, intergranular corrosion properties and microstructure analysis

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Abstract

Purpose – The purpose of this study is on AISI 409 M ferritic stainless steel (FSS) which is developing a preferred choice for railway carriages, storage tanks and reactors in chemical plants. The intergranular corrosion behavior of welded SS 409 M has been studied in H₂SO₄ solution (0.5 M) with the addition of NH₄SCN (0.01 M) with different heat input. As this study is very important in context of various chemical and petrochemical industries.

Design/methodology/approach – The microstructure, mechanical properties and intergranular corrosion properties of AISI 409 M FSS using shielded metal arc welding were investigated. Shielded metal arc welding with different welding current values are used to change the heat input in the joints resulted in the microstructural variations. The microstructure of the welded steel was carefully inspected along the width of the heat-affected zone (HAZ) and the transverse-section of the thin plate.

Findings – The width of heat affected zone (3.1, 4.2 and 5.8 mm) increases on increasing the welding heat input. Due to change in grain size (grain coarsening) as HAZ increased. From the microstructure, it was observed that the large grain growth which is dendritic and the structure become finer to increase in welding heat input. For lower heat input, the maximum microhardness value (388HV) was observed compared with medium (351 HV) and higher heat input (344 HV), which is caused by a rapid cooling rate and the depleted area of chromium (Cr) and nickel (Ni). The increase in weld heat input decreases tensile strength, i.e. 465 MPa, 440 MPa and 418 MPa for low, medium and high heat input, respectively. This is because of grain coarsening and chromium carbide precipitation in sensitized zone and wider HAZ. The degree of sensitization increases (27.04%, 31.86% and 36.08%) to increase welding heat input because of chromium carbide deposition at the grain boundaries. The results revealed that the higher degree of sensitization and the difference in intergranular corrosion behavior under high heat input are related to the grain growth in the HAZ and the weld zone.

Originality/value – The study is based on intergranular corrosion behavior of welded SS 409 M in H₂SO₄ solution (0.5 M) with the addition of NH₄SCN (0.01 M) with different heat input which is rarely found in literature.

Keywords Microstructure, Hardness, SS 409M, SMAW, Hardness, HAZ, Intergranular corrosion

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1. Introduction

Ferritic stainless steel (SS) 409 M is modified version of AISI 409 M with a lower carbon content (0.03%) and with a very

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Effect of number of welding passes on the microstructure, mechanical and intergranular corrosion properties of 409M ferritic stainless steel

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Abstract

Purpose – This paper aims to study the effect of number of welding passes on microstructure, mechanical and corrosion properties of 409 M ferritic stainless steel. Shielded metal arc welding (SMAW) process is used to weld two metal sheets of 409 M having 3 mm thickness as bead-on-plate with single, double and triple passes. Microstructures were observed at transverse section with the help of optical microscope and with increasing number of passes grain growth, and the width of heat-affected zone (HAZ) increases. The results of tensile tests revealed that as number of passes increases, there is reduction in tensile strength and ductility. Double loop electrochemical potentiokinetic reactivation (DL-EPR) test revealed that as number of passes increases, the degree of sensitization increases. This is due to the deposition of chromium carbides at the grain boundaries and the associated depletion of chromium.

Design/methodology/approach – Three welded plates of single, double and triple pass were welded by SMAW process. From three welded plates (single, double and triple passes), samples for microstructural examination were cut in transverse direction (perpendicular to welding direction) with the help of wire-cut electrical discharge machine (EDM). The welded plates were sliced using wire-cut EDM along transverse direction for preparing optical microscopy, tensile testing, microhardness and DL-EPR testing specimens.

Findings – From the microstructure, it was observed that the large grain growth, which is dendritic, and the structure become finer to increase in number of welding passes. As number of passes increases, the width of HAZ increases because of the higher temperature at the welded zone. The tensile strength decreases to increase the number of welding passes because of grain coarsening and chromium carbide precipitation in sensitized zone and wider HAZ. The maximum microhardness value was observed for single-pass weld as compared to double- and triple-pass welds because of the fast cooling rate. The degree of sensitization increases to increase the number of passes because of chromium carbide deposition at the grain boundaries.

Originality/value – The authors declare that the manuscript is original and not published elsewhere, and there is no conflict of interest to publish this manuscript.

Keywords 409M ferritic stainless steel, Shielded metal arc welding, Number of welding passes, Tensile test, Microhardness and degree of sensitization, Degree of sensitization, Microhardness

Paper type Research paper

1. Introduction

Ferritic stainless steels (FSS) are the most extensively used group of stainless steels because of their noble corrosion resistance compared to mild steel and is less expensive compared to

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Analysis of Roller for Hot Rolling Mill

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Abstract – Temperature of the work piece influences spread appreciably. Breakages of work roll journals caused by bending or torque are mainly spontaneous ruptures due to high peak loads. This is also valid for barrel breakage of work rolls and in particular for 4-Hi work rolls. Journals breaking due to high torque on the drive end of work rolls have to be considered as predetermined breaking points in the case of mechanical overloads from setting the wrong roll gap, foreign bodies entering the roll gaped. This applies if there is no other protection equipment against torsion overloads or if this equipment is not working correctly. To development the model and analysis which facilitated research on surfaces. This research enabled the identification of mechanisms present during wear, at both the laboratory level and the industrial level. To develop a mathematical model for predicting the wear behaviour of bearing rolls that is used during hot rolling phase in production lines. Such a model would allow monitoring and prediction of roller wear to optimise the rotation, maintenance, and replacement of rollers, minimising corrective maintenance, downtime, and failures that could affect product quality. Most of the existing wear models use a series of analyzed variables and empirical coefficients.

Keywords- Empirical Methods, Homogeneous Deformation Method, strain and temperature distribution, Slip Line Analysis.

I- INTRODUCTION

Today, there are roll grades available which provide good performance down to discard size without abnormal stock loss for all established rolling operations if standard rolling conditions prevail. Of course, correct handling of the rolls is essential including campaign length and adequate dressing practice with appropriate non-destructive testing. In addition, measurement of additional features such as wear profile and work hardening can also be Beneficial. When specifying work roll grades for wide strip mills, roll manufacturers need to know the rolling conditions and in particular the Finishing Mill stand number in which the roll will be used, the specific rolling loads per unit of strip Width and the maximum rebinding applied through the journals. These facts will determine the selection of materials for the core and working layer on the barrel surface for compound rolls. Despite careful attention from the roll supplier and user, roll failures will happen in service which lead to partial or total loss of the rolls and may even cause subsequent damage to rolling equipment. These frustrating failures can have different kinds of origin related to either roll manufacture or the specific rolling conditions. The topography of the

fracture indicates whether the breakage was matter of severe peak load or a fatigue fracture. Fatigue fractures start from primary cracks and grow progressively generating a classical fracture surface. These fractures are relatively smooth and exhibit arrest lines. Once the fatigue fracture achieves a critical size, a spontaneous rupture of the remaining section occurs. Typical examples of fatigue fractures include spalling of back up rolls and journal breakage of back up rolls or 2-Hi work rolls starting from the fillet area. (Stress corrosion may be involved). Breakages of work roll journals caused by bending or torque are mainly spontaneous ruptures due to high peak loads. This is also valid for barrel breakage of work rolls and in particular for 4-Hi work rolls. Journals breaking due to high torque on the drive end of work rolls have to be considered as predetermined breaking points in the case of mechanical overloads from setting the wrong roll gap, foreign bodies entering the roll gaped. This applies if there is no other protection equipment against torsion overloads or if this equipment is not working correctly. The roll journal failure prevents catastrophic damage of mill equipment such as spindles, gear boxes and drive motors. Failures resulting from torsional overloads show fracture planes at 45 degrees to the axis. To limit milldam age, a correct design of the

ORIGINAL ARTICLE

An effective solution to numerical and multi-disciplinary design optimization problems using chaotic slime mold algorithm

Dinesh Dhawale^{1,2} · Vikram Kumar Kamboj^{1,2} · Priyanka Anand³

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Abstract

Slime mold algorithm (SMA) is a recently developed meta-heuristic algorithm that mimics the ability of a single cell organism (slime mold) for finding the shortest paths between food centers to search or explore a better solution. It is noticed that entrapment in local minima is the most common problem of these meta-heuristic algorithms. Thus, to further enhance the exploitation phase of SMA, this paper introduces a novel chaotic algorithm in which sinusoidal chaotic function has been combined with the basic SMA. The resultant chaotic slime mold algorithm (CSMA) is applied to 23 extensively used standard test functions and 10 multidisciplinary design problems. To check the validity of the proposed algorithm, results of CSMA has been compared with other recently developed and well-known classical optimizers such as PSO, DE, SSA, MVO, GWO, DE, MFO, SCA, CS, TSA, PSO-DE, GA, HS, Ray and Sain, MBA, ACO, and MMA. Statistical results suggest that chaotic strategy facilitates SMA to provide better performance in terms of solution accuracy. The simulation result shows that the developed chaotic algorithm outperforms on almost all benchmark functions and multidisciplinary engineering design problems with superior convergence.

Keywords Slime mold algorithm (SMA) · CSMA · Convergence rate

1 Introduction

Meta-heuristic algorithms being simple and easy to implement are effectively applied to continuous, discrete, constrained, or unconstrained problems which were found hard to solve using conventional methods such as conjugate gradient, quadratic programming, and quasi-network methods. These meta-heuristic algorithms are single solution based which provides only one solution during optimization or population-based which mimics mostly natural phenomena and evolves a set of solutions during each iteration. These

meta-heuristic algorithms are mainly categorized into four main groups: evolutionary, physics-based, human-based and swarm intelligence type algorithms. Evolutionary algorithms (EAs) such as genetic algorithm (GA), differential evolution (DE) [1], genetic programming (GP) [2], and evolution strategy (ES) [3] mimics behaviors such as selection, recombination and mutation. The second class utilizes some physical laws such as gravitational search algorithm (GSA) [4], big bang big crunch (BBBC) [5], multi verse optimizer (MVO) [6] and sine cosine algorithm (SCA) [7]. The third category mimics certain human behaviors which includes some of the well-known algorithms such as Tabu search (TS) [8], teaching learning based optimization (TLBO) [9], socio evolution and learning optimization (SELO). The last category of P-meta-heuristics uses collective or social intelligence that artificially simulates the behaviors such moving in swarms, flocks and herds. This Swarm Intelligence includes particle swarm optimization (PSO) [10], ant colony optimization (ACO) [11], artificial bee colony (ABC) [12], machine learning (ML) [13], bat inspired algorithm (BA) [14], grey wolf optimization (GWO) [15], moth flame optimization (MFO) [16], artificial neural network (ANN) [17] and Harris Hawk optimizer (HHO) [18]. Machine learning

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CASE STUDY ON THE CAUSE OF DRIVE FAILURE IN AN INDUSTRY

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ABSTRACT

KEC Int Pvt Ltd is a Tower manufacturing company, one of its factories is located in Butlana, Nagpur, Maharashtra, India. Machines like cranes are used in manufacturing process like moving workloads quickly and safely, one such operation of the crane is galvanizing steel bars. A Variable frequency drives (VFD) is used as motor controller for the crane to perform various movements, VFDs provide the intelligence, performance, flexibility and safety for crane applications. With continuous usage the drives are prone to failure. Some of the reasons why drives fail include module failure, power surges and bad network connections. In this study, issues can also cause from overheating, moisture and electromagnetic interference. One of such failures occurred during the process of galvanizing steel bars, the VFD lost its ability to signal the motor to perform the hoisting movement. In this Case Study we will see how the factory engineers dealt with this systematic issue, inspected the system to ensure these problems do not spiral out of hand, repaired the fault and now use an effective solution by implementing an air cooling mechanism to the VFD panel.

Keywords. Case Study, Variable Frequency Drive, Drive Failure, Galvanizing, Air Cooling Mechanism

1 INTRODUCTION

The industrial revolution has put the use complex machinery in variety of diverse applications to do the work that manpower cannot. Crane control have significantly advanced in the field of technology in the past few years. Ward Leonard system's contribution to DC drive technology and the advent of powerful Insulated Gate Bipolar Transistors in the 90s introduced the AC drive for motor control. In this paper we will discuss about the case study on a particular type of drive failure that happened while using heavy machinery in an industry during work operation. The Case Study is based upon a heavy-duty crane in KEC International Ltd which ceased to operate due to Variable Frequency Drive failure, thus the process of detecting the fault, repairing it and finding an effective solution is explained.

KEC International Private Limited, India, is an Engineering, Procurement, and Construction (EPC) company. Tower Manufacturing Facility of KEC, Butlana, Nagpur, Maharashtra, India is managed with proper technology and is one of the largest factories in the field of manufacturing towers in Maharashtra. In addition to this, the capability of catering to tower wise bundling requirement of the customer to enable storage and convenient to tower to desired locations. For this, there is an in-house developed special purpose machinery and equipment for bundling press for bundling the different section sizes and capable of catering to zinc coat thickness in the range of 65 to 130 microns, as per customer requirement, this process of coating steel bars to prevent it from corrosion is called galvanizing. Heavy duty cranes are used to move the steel bars across hot oil tank. In the process of galvanizing, the 5.5kW, 10.9A, 945 RPM motor on the crane is controlled by a 5.5kW VFD VFD Controller. To make sure that at the rated speed of the drive equipment is nothing. If the rated speed of the VFD should be the same as those of the motor. This is why in our case, both the VFD and the crane's motor is a 5.5kW.

1.1 Basics about VFD:

A Variable Frequency Drive also known as VFD acts as a controller to an electric motor by changing the frequency and voltage supplied to the motor. The other names for a VFD are variable speed drive, adjustable speed/frequency drive, Microdrive, AC drive and inverter. In VFDs, frequency is directly related to the motor speed which means, faster the frequency, faster the RPMs will go. If an application does not require an electric motor to run at full speed, the VFD can be used to ramp down the frequency and voltage to get the requirements of the electric motor's load. Whenever the application's motor speed is required to change, the VFD can simply turn up or down the motor speed to meet the speed requirement. Usually, the AC electric motor used in a VFD system is a three-phase induction motor.

USE OF PI AND PID CONTROLLER IN REGULATING SPEED OF INDUCTION MOTOR DRIVE

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ABSTRACT

This paper presents design and execution of vector control of induction motor with help of PI and PID controllers using MATLAB software. Three phase induction motor drives are recurrently employed in industrial sector because of these motors having features like mechanically simple, highly dependable, rugged, and cost effective per horsepower as compared to DC motors and ability to produce more torque and effectiveness than single-phase AC motors. The performance of induction motor has been executed using vector control method and evaluated on the grounds of speed as well as torque. The PI, PID controllers were utilized in developing the simplified control system. The 3 phase induction motor performance is carried out for no load and full load condition. Improvisations in performance of 3 phase induction motor is accomplished using PID which gives better rise time with the reduction in overshoot as compared with PI controller. Simulation is executed in MATLAB/SIMULINK environment and comparison of results is done for induction motor speed control.

Keywords: Three Phase Induction Motor, Vector Control Method, MATLAB, PI & PID Controller.

I. INTRODUCTION

Induction motors basically form a major part of domestic as well as industrial applications. Induction motors are called asynchronous motors due to the rotating function being carried out at asynchronous speed. Asynchronous speed is usually lesser than synchronous speed. Induction motors are cost effective and possess low maintenance feature. Also its efficiency is higher as compared to other methods. Similar to various DC motors, Induction motor comprises of both rotor as well as stator. On the contrary, here in this induction motor we are bringing a new change wherein the supply is given only to stator windings. Due to electromagnetic induction due to transformer action the rotor windings gets excited. That being the case, induction motor is also known as Rotating Transformer. Squirrel cage motors are the extensively used induction motors as they are cheaper and widespread. No external current supply is required for the rotor to produce a magnetic field in the rotor. This is the reason why this motor is so robust and inexpensive. The technique termed as Vector control or Field Oriented Control is very useful in varying the speed of an induction motor over a wide range. Among these major benefits of vector control, this technique of control will be acknowledged as the industry-standard control for ac drives.

The induction motor speed control is conventionally controlled by fixed gain PI and PID controllers. There is several control strategies used for speed control of induction motor. For speed control of induction motor, we use different types of controllers like conventional PI and PID controllers. On application of load on the motor, the motor speed declines. This reduced speed will serve as feedback to the summation block. The summation block comprises of two inputs, i.e. the reference speed and the feedback speed. The error signal is produced from both of these inputs that is then fed to the PI and PID controllers. Here all these controllers functions and brings back the speed to the reference value. Consequently in this project scheme, we achieved the closed loop system by means of PI and PID controller. Once the speed response for various controllers is obtained, the final outcome is attained after comparison of results. Speed control techniques for induction motor drive which we are using in this project:

- Speed control of induction motor in closed loop system using PI Controller
- Speed control of induction motor in closed loop system using PID Controller

II. TYPES OF CONTROLLERS

A feedback controller measures the output of a process, and so influences the input as required for driving the method variable headed for the required point. A controller responds to set point changes introduced by the operators in additionally to random disturbances to the method variable triggered by external forces. It repeats this measure-decide-actuate sequence over and over till the process variable equals the point.



SOLAR BASED AUTOMATIC SANITIZATION OF CLASSROOM

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Abstract: The purpose of this project was to develop an automatic Sanitization of the classroom. The energy demand of the system could be covered by solar panel system. In addition of toggle switch, it operate the device by both the supply. Sanitation is one of the largest problems faced by people in our country and how we could solve problem by devices and how the system is well stabilize by using wireless implementation. The final design consisted of a Solar panel system which is connected to charge controller and the AC source is connected to SMPS power supply, Arduino and GSM module are used to control ON/OFF operation of the device. The pump of the sanitizer sprinkles switch ON automatically by call of mobile phone and also switch OFF by another call. we can also turn ON and OFF this device by manually. The relay is use to operate the pump and the pipes and nozzle of sprinkles are arrange in ceiling of the room in such a way resulted in a system that sanitizes the complete area of the room and operates automatically through mobile.

Keywords: Solar panel system, Arduino, GSM, Pump.

I. INTRODUCTION

According to the study, this device can be mounted anywhere and it works in an automated manner. The device can be installed in any premises. The machine will spray sanitizer this will sanitize the person's entire body, clothes and shoes. This device can be installed at any place where there is movement of people, so that the person getting sanitized. This device has been made according to today's requirement. We are using normal sanitizer currently being used by the government. Due to this sanitization, it is possible to avoid most of the viruses that cause harm to the person. Validation of the dose, exposure time, frequency is under process. However, even after being sanitized with this device, one is required to wear masks, make social distancing and wash hands with soap at regular intervals. In today's global environment, everyone is trying to fight against the covid-19 virus. At present, the only way to defend ourselves from corona is to sanitize properly and maintain social distance. This device helps to prevent from viruses by sprinkling the sanitizer to person and entire objects of area of classroom by automatically operate.

II. OBJECTIVES

1. The device operates on both the solar system panel and regular source
2. The charging of the battery takes place by solar panel system and device is operate by charge controller
3. It operates automatically by GSM module which works by mobile application. Also it operates manually by ON/OFF button.
4. The device shows ON/OFF operation on LED screen.
5. The Automatic sanitization device sanitizes complete area of the room as it set up in ceiling of the room and reduces human efforts

III. PROJECT METHODOLOGY

The block diagram of Solar based Automatic Sanitization of classroom. The block diagram of device consist of 3 parts. power supply, automation and pump. the device has dual power supply device has dual power supply, solar supply and AC source and It controlled by relay, voltage regulator, toggle switch are connected to Arduino. The output of Arduino connected to relay drive, relay and pump.

ANALYSIS OF Z-SOURCE INVERTER FED IM DRIVES USING PV SOURCE

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ABSTRACT

In this paper we have studied the comparative performance analysis of a ZSI and VSI which is fed by an PV source. The ZSI impedance network has a unique LC network which is connect with dc link and controller to provide optimal output ac voltage. The result output of an ZSI fed IM and VSI fed IM which is compare different performance parameter as stator & rotor current, speed characteristics and torque. Simulations of the complete models of convectional inverter and ZSI is performing in MATLAB

Keywords: PV cell, Z-source inverter, VSI, traditional inverter, Maximum Power Point Tracking.

I. INTRODUCTION

In an induction motor for the vary the speed we mostly use an convectional inverter i.e. VSI or CSI but due to some drawback of an this inverter that involves switching losses and this inverters has an more complex the control algorithms and interface circuits to come up with six PWM logic signals .In VSI or CSI , at the same instant time the 2 switches never be switched ON if this happens it become cause a short circuit and burnout the inverter and therefore the voltage obtainable can not extended than the dc bus voltage. This drawback can be overcome by the Z-source inverter. The ZSI impedance network has an unique LC network which is connect with dc link to replace the traditional dc link. The ZSI can buck and boost voltage to an output voltage to an further extend.

PV source and A dc voltage source contained by a large capacitor feed the main converter circuit, a 3 phase bridge This dc voltage source have a battery, fuel cell stack, diode ,rectifier or capacitor. 6 switches which are represented by IGBTs with an anti-parallel diode are used in the main circuit; for an a bidirectional current flow and unidirectional voltage blocking capability used IGBTs 6 switches with an anti-parallel diode in main circuit. From traditional converters VSI and CSI We used mostly used VSI.

The limitations of traditional converter are:

- The capability of an traditional converter is only used as buck converter or boost converter
- %Efficiency Lower down where over drive is required
- NO two thyristors can be gated ON in the same leg
- Only 8 switching states are available in an traditional converter.
- Either capacitor or inductor available for energy storage and suppress ripples.

The Z-source inverter mainly used the shoot-through states to boost the dc bus voltage for the turning ON two thyristors of the upper and lower phase same leg. As a result the Z-source inverter can buck and boost voltage to a wanted output voltage that is more than dc bus voltage. Therefore improve the reliability of an inverter, the shoot-through can not occurs to burnout the circuit. The advantages of an ZSI has a low-cost, reliable and highly efficient single-stage structure for boost and buck power conversion. The main structure circuit of the Z-source inverter is presented in Fig.1. The maximum constant boost control can greatly reduce the L and C requirements of the Z-source impedance network.

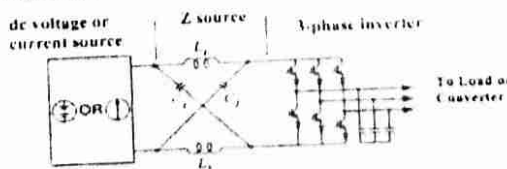


Figure1: Structure Of ZSI

Elimination of Harmonics In Multilevel Inverter Using Artificial Intelligent Techniques.

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ABSTRACT

The proposed work shows the power industries demands for high level of voltage and power signal. To switch these types of signal the multilevel inverter is developed. The multilevel inverter is accomplished to manage the wide range of voltage signal. The power and voltage signal generated in the power industries should not enclose the undesired harmonics. To get rid of the unwanted harmonics from the output waveform of multilevel voltage source inverters, a variety of modulation techniques with the help of AI and optimization are reviewed in this work. Various optimization techniques to calculate the nonlinear transcendental equations in selective Harmonic Elimination are also include.

Keyword : Multilevel Inverter, Particle Swarm Optimization (PSO), Artificial Intelligent (AI) , Selective Harmonic Elimination(SHE)

INTRODUCTION:

Multilevel inverters are increasingly being used in medium and high power applications due to their many advantages such as low power dissipation on power switches, low harmonic contents and low electromagnetic interference (EMI) outputs. The elementary concept of a multilevel converter to achieve higher power is to use a series of power semiconductor switches with several lower voltage sources. The multilevel inverter is to synthesize a linear sinusoidal voltage from several levels of dc voltages. Capacitors, batteries, and renewable energy voltage sources can be used multiple dc voltage sources.

As number of levels increases, the synthesized output waveform has more steps, which provides a staircase wave that approaches a desired waveform. Also, as steps are added to waveform, the harmonic distortion of

Renewable energy sources such as photovoltaic, wind and fuel cells can be easily interfaced to a multilevel converter system for a high power application.

Features Of Multilevel Inverter:

Staircase Waveform Quality: Multilevel converters not only can generate the output voltages with very low distortion, but also can reduce the dv/dt stresses; therefore electromagnetic compatibility (EMC) problems can be reduced.

Common-mode (CM) Voltage: Multilevel converters produce smaller CM voltage; therefore, the stress in the bearings of a motor connected to a multilevel motor drive can be reduced. Furthermore, CM voltage can be eliminated by using advanced modulation strategies.

Input Current: Multilevel converters can draw input current with low distortion.

Switching Frequency: Multilevel converters can operate at both fundamental switching frequency and high switching frequency PWM. It should be noted that lower switching frequency usually means lower switching loss and higher efficiency.

Need of Harmonic Reduction:

- Harmonics cause unnecessary heat in equipment connected to harmonic source.
- System rich in harmonics is generally associated with poor power factor and low efficiency.
- Harmonics can initiate system resonance that can severely disrupt operation.

Hence, control of harmonic content is important to avoid the unnecessary power loss and to reduce maintenance cost of the drive system.

A Review: Fundamentals and Speed Control of BLDC Motor

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Abstract: In industries most of the applications requires efficient variable speed drive. Brushless DC motor is the solution for above requirement as conventional DC motor requires high maintenance and low efficiency. BLDC motor also have better speed-torque, lesser noise, less maintenance and higher efficiency; since brushes in BLDC motor do not wear and are not prone to sparking. The control is relatively complex but motor performance is superior to conventional dc motors on any speed with easy speed control.

This review paper focuses on the fundamentals and various speed control strategies applied to BLDC motor. This paper should prove useful to both researchers as well as practicing engineers as a signpost to the current state of the art.

Keywords: BLDC motor, control strategies, trapezoidal back emf.

1. Introduction

The major difference between the conventional motor and BLDC motor is that BLDC motor does not need brushes unlike conventional motor. BLDC is different version of PMSM having same structure but only difference is that the back-EMF is trapezoidal in shape in case of PMBLDCM while its sinusoidal in case of PMSM.

Hence it can be concluded that permanent magnet brushless DC motor is a polyphase synchronous motor having permanent magnet as a rotor. BLDC motor combines a solid state inverter, polyphase Stator winding, permanent magnet rotor, rotor position sensor. The running state of rotor of BLDCM is result of the feedback from hall effect sensor and control logic used to excite stator winding phases which are govern by gate signal of inverter switches which is controlled by control logic in inner loop circuit. A fair amount of research work has been conducted on BLDC motor fundamentals and speed control.

The main aim of this paper is to review the work done in the area of BLDC motor and various modes of speed control used for BLDC motor. The review categorizes the literature into many different areas like BLDC motor principle, mathematical modelling, working speed control methods, etc. It should prove useful to both researchers as well as practicing engineers.

2. Literature survey of brushless dc motor

Most of the literatures of BLDC motor is conveys that BLDC motor needs variable frequency supplies for operation since BLDCM requires rectangular shaped stator current for operation which not readily available from the ac mains. This supply can be made available by the use of inverters. The hall effect sensors located at every 60 degree can be used. Any 2 phases conduct at a time. The details of modelling and construction are presented in papers.

The paper [2] presents the quantitative comparison between BLDC, PMSM, Brushed DC and Stepping Motor Technologies. Its results support the common knowledge concerning the field of application of each technology and new insights follow from this quantitative comparison.



“FPGA Implementation and Comparative Analysis of an Efficient Multiplier”

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Abstract

This a new architecture for performing design-efficient multipliers using Kogge Stone Adders with Mux and Vedic Multiplication. design of an efficient 32x32 bit Vedic multiplier using the UrdhvaTriyakabhyam (UT) sutra of Vedic mathematics. Vedic mathematics is based on 16 formulae constructed by Sri Bharati Krishna Tirthaji. Multiplication operation is the most vital operation in many numeric computations. The Adder which is used to implement the Kogge Stone Adder, which utilizes MUX, a parallel prefix form of the Carry Look Ahead Adder, and it is a widely used adder in today's industry. One of the most reliable Vedic mathematics scriptures, UrdhvaTriyakbhyam, makes a difference in the process of actual multiplication. The adder used is widely known for designing the fastest adder possible because it produces a carry signal in $O(\log n)$ time. Offering Kogge Stone Adders using MUX offers fewer components with less path delays and better rates than other existing Kogge Stone Adders and other Adders. In this study, we have used KSA in Mux and Vedic Multiplication. This tentative procedure estimates the performance of the proposed design in terms of logic and route delay. Experimental results show that multipliers using the kogge stone adder and Vedic Multiplication perform faster than other adders. The proposed algorithm was developed via verilog HDL. The implementation was done using Xilinx ise 12.3.

Keyword: Vedic multiplier, kogge stone, Urdhva Triyakbhyam, Xilinx ISE12.3

1. Introduction

Multipliers play an important role in today's digital signal processing and various other applications. Essential design targets of multiplier include high speed, low power consumption, regularity of layout and hence less area or even combination of the above. In one multiplier are required thereby making them suitable for various VLSI implementations[1]. The multipliers are the heart of any high-speed computational devices. A configurable multiplier designed for single 32-bit multiplication operations, either single 16-bit multiplication or twin parallel 16-bit multiplication. for low power consumption and high speed operation. Therefore, the proposed multiplier surpasses existing multipliers in terms of speed and power efficiency. The basic tasks associated with Digital Signal Processing systems are Multiplication, Addition and Accumulation. Additions are an integral part of a Digital, DSP or control system. Therefore, the accurate and fast operations of digital systems rely on the performance of the adders. Therefore, improving adder performance is a major area of research in VLSI system design. Because multiplication plays an important role in digital signal processing (DSP) and various other applications, we have described the vedic multiplication algorithm for digital multiplication. With the update of technological advances, many researchers and scholars are attempting to design, develop, or implement multipliers that provide either high speed, low power consumption, regularity of layout, and thus reduction in area, or a combination thereof. multiplier. It'll be utilised to create a variety of high-speed, low-power, miniature VLSI circuits.

2. Objectives

The main aim of this project is to implement one of the fastest adder architectures using VLSI technology, which is the Kogge-Stone adder, and validate its performance, power, and area as compared to other adder architectures, including the ripple carry adder, carry look ahead adder, and the default adder from the standard cell library. The objective is to have a fast VLSI adder that can be integrated into larger systems and improve its performance. Some of the works that implement the KSA include where an adaptive power gating is applied on a 32-bit KSA design.

A NEW Z-SOURCE INVERTER FOR APPLICATION IN WIND ENERGY CONVERSION SYSTEM

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ABSTRACT:

Increase in the demand of renewable energy sources has resulted into the boosting of demand of wind energy generating systems. The intermittent nature of wind energy has driven many researchers to focus on the power electronic converters for suitable interfacing with the conventional loads. The conventional AC loads must be supplied with quality power in order to increase the longevity of the electrical equipment. Development of improved converters are focused from many years however, the performance of Z- source inverters (ZSI) over other power converters have created a motivation to today's researchers to concentrate on ZSI based wind energy conversion system. This paper focuses on the design and implementation of an improved ZSI which uses lesser number of switches compared to the conventional ZSI. Also, the converter is able to deliver a constant voltage at the output of the inverter in order to operate the generator smoothly which is linked at the output terminals. The proposed converter is simulated using MATLAB/SIMULINK and the obtained outcomes are furnished in this paper. The efficiency of operation proves the proposed system efficacy.

Keywords: Wind energy conversion system, ZSI, Power electronic converter, Renewable energy, Power conversion

Abbreviations: ZSI, Z-source Inverter; WECS, wind energy conversion system; PWM, pulse width modulated; I-ZSI, improved ZSI:

I INTRODUCTION

Increase in population has led to the increase in dependency on petroleum products. These petroleum products generate poisonous byproducts while operation [1-5]. The increase in global warming has motivated researchers to search for non-conventional energy sources [6]. Among all the non-conventional sources, wind energy has got more focus because of its various advantages [7]. Advantages such as, easy availability, zero operational cost and clean energy generation have increased the demand of wind energy among users [8].

A Low Power and High Speed Voltage Level Shifter Based on a Regulated Cross Coupled Pull Up Network

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Abstract— In this brief, a fast and very low power voltage level shifter (LS) is presented. By using a new regulated cross-coupled (RCC) pull-up network, the switching speed is boosted and the dynamic power consumption is highly reduced. The proposed (LS) has the ability to convert input signals with voltage levels much lower than the threshold voltage of a MOS device to higher nominal supply voltage levels. The presented LS occupies a small silicon area owing to its very low number of elements and is ultra-low-power, making it suitable for low-power applications such as implantable medical devices and wireless sensor networks. Results of the post-layout simulation in a standard 0.18- μm CMOS technology show that the proposed circuit can convert up input voltage levels as low as 80 mV. The power dissipation and propagation delay of the proposed level shifter for a low/high supply voltages of 0.4/1.8 V and input frequency of 1 MHz are 123.1 nW and 23.7 ns, respectively.

Index Terms— Dual-supply, level shifter, differential cascade voltage switch (DCVS), subthreshold circuit, low-power

I. INTRODUCTION:

The use of multiple voltages increases circuit complexity, and therefore requires throughout performance and reliability analysis. Level shifters need to be embedded for interfacing of separate voltage domains, and digital logic segments need to be designed for their dedicated voltage supply. The utilization of dynamic voltage scaling empowers for further enhancement among execution and power sparing by varying the supply voltage based on the speed necessities of the integrated circuit (IC) at any point of time. Many sensor interfaces need high voltage actuation. Applications include electrostatic actuation or ultrasonic transducers [1], [2], where typical operating voltage varies from above 10V for piezo-electric transducers and Piezo-electric Micromachined Ultrasonic Transducers (PMUT) to above 50V for Capacitive Micro-machined Ultrasonic Transducers (CMUT). Furthermore, the high resolution requirements necessitate above 10MHz driving frequency for the transducers with over 10pF parasitic capacitance. To address the requirements we are presenting a driver capable of both high voltage and high band-width operation

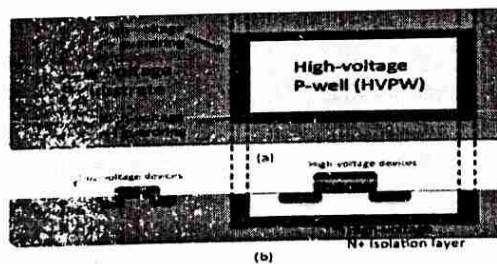


Fig. 1. Typical layout for high-voltage process (a)topview

explains the circuit we proposed for efficient high-voltage level-shifting.. There are several high-voltage processes available from various foundries. For example, the TSMC 32V/0.18 μm process, consists of normal transistors operating at nominal VDD=1.8V, and special-designed high-voltage transducers operating at a relatively high supply voltage HV VDD=32V. Due to potential latch-up problems, the high-voltage transistors is inside highvoltage wells isolated with high-voltage guard-ring and highvoltage bottom isolation layer. Fig. 1 gives an example for The high-voltage MOSFET (HVMOS) has thicker oxide thickness to prevent oxide breakdown from high gate voltage. A clear drawback is reduced Cox and turn-on current. Further Fig. 1. Typical layout for high-voltage process (a)topview (b)sideview. more, the minimum gate length of HVMOS in this process is limited to 1.5 μm . Also HV devices need to be spaced further than LV transistors, not to mention area consumed by guarding itself. These several drawback make it challenging to design a high-speed high voltage circuit efficiently without large area or power penalty. To minimize the area and power overhead, typical highvoltage sensor interface circuits perform most of the signal processing such as detection and frequency control in low voltage domain, following by a level-shifter to shift up the signal to high-voltage domain as illustrated in Fig. 2. The level-shifter often consumes significant power

Collaborative Filtering Based Movie Recommendation System

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Abstract— Now-a-days recommender systems are used in our day to day life. However, they are distant from flawlessness. In this work, we will try to understand the various types of recommendation systems also compare their output with other smaller datasets. We will be attempting to develop a scalable model to perform statistics. We commence by developing and comparing the different kinds of prototypes on a smaller dataset of 1000 ratings. Then, we try to gauge the system so that it is able to handle 200 ratings by using MS SQL server. It is found that for a brief dataset, actualizing user-based collaborative sifting comes about with way better and effective yields.

Key Words: Recommendations systems, Collaborative filtering, Content Based Filtering prototype, SQL server.

1. Introduction

A suggestion framework could be a sort of data filtering framework which challenges to expect the needs of a client, and make proposals on the premise of user's needs. Gigantic run of applications of proposal frameworks are given to the client. The ubiquity of proposals frameworks have slowly expanded and are as of late actualized in nearly all online stages that individuals utilize. The substance of such framework contrasts from movies, podcasts, books and recordings, to colleagues and stories on social media, to commodities on e-commerce websites, to individuals on commercial and dating websites. Frequently, these frameworks are able to recover and channel information approximately a user's inclinations, and can utilize this intel to progress their proposals within the up and coming period. For an occurrence, Twitter can analyze your collaboration with a few stories on your divider so as to comprehend what sorts of stories if you don't mind you. Numerous a times, these frameworks can be ad libbed on the premise of exercises of a expansive number of individuals. Due to the progresses in recommender frameworks, clients ceaselessly anticipate great comes about. They have a moo edge for administrations that are not able to create appropriate proposals.

If a music streaming application is not able to foresee and play song that the user prefers, then the user will just stop using it. This has driven to a tall significance by specialized enterprises on refining their proposal structures. In any case, the issue is more complicated than it shows up. Each client has distinctive likes and loathes. In expansion, indeed the taste of a single client can contrast depending on a huge number of viewpoints, such as temperament, season, or sort of movement the client is performing. For an occurrence, the sort of music one would incline toward to tune in amid working out shifts fundamentally from the sort of music he would tune in to whereas planning supper. They must find unused zones to decide more around the client, while still deciding nearly all of what is as of now known approximately of the client.

Two basically critical strategies are broadly utilized for recommender frameworks. One is content-based filtering,

where we endeavor to shape the clients inclinations utilizing information recovered, and recommend things based on that profile. The other is collaborative filtering, where in we attempt to cluster alike clients together and utilize information almost the gather to form suggestions to the client.

Introduction to Collaborative Filtering

The fundamental strategy of collaborative filtering frameworks is that these undetermined appraisals can be credited since the taken note evaluations are regularly exceedingly connected over a few clients and things. For an occurrence, accept two clients named David and Albert, who have exceptionally comparable tastes. In the event that the evaluations, which both have expressed, are exceptionally comparable, at that point their resemblance can be decided by the basic calculation. In such cases, there's a tall likelihood that the evaluations where in fair one of them has definite value, are moreover likely to be comparable. This closeness can be utilized to create translations approximately mostly expressed values. Nearly all the ventures for collaborative filtering accentuation on leveraging either item associations or user associations for the calculation procedure. Numerous of the models execute both sorts of relationships. Furthermore, a few mock-ups utilize wisely outlined optimization strategies to produce a preparing show in much the comparable way a classifier creates a preparing demonstrate from the mentioned or specified information. This model is afterward utilized for doling out the truant values within the network, within the comparable way that a classifier allots the missing test labels. There are two types of methods which are frequently implemented in collaborative filtering that are denoted to as memory-dependent procedures and model-dependent procedures.

Introduction to Content Based Filtering

Content Based Suggestion method checks for the adores and aversions of the client and makes a User-based Profile. For creating a client profile, we check for the item profiles and their comparable user rating. The user profile is the combination of sum of the item profiles where combination being the ratings customer or user has evaluated. After profile of the client has been created, we assess the likeness of the client profile with all the things within the database, which is considered utilizing cosine likeness between the user created profile and item profile.

Benefits of Content oriented strategy is that other user's data or information isn't basic, and the recommender framework can praise unused commodities or anything which are not assessed by and by, all things considered the recommender framework will not prescribe the things exterior the sort of things the client has given appraisals of.

An Energy Efficient Clustering Algorithm for Network Lifetime in Wireless Sensor Network

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ABSTRACT

In wireless sensor networks, information aggregation accept a fundamental part in lessening essentialness use. Starting late, investigate has focused on secure information aggregation due to the open and disagreeable condition passed on. The Homomorphic Encryption (HE) contrive is generally used to secure information grouping. In any case, HE-based information aggregation designs have the going with disservices: adaptability, unapproved aggregation, and obliged aggregation limits. To deal with these issues, we propose a safe information aggregation plot by solidifying homomorphic encryption development with a check plan. To answer this issue we exhibited a system addresses a procedure in that intense cluster head is picked based on the partition from the base station and remaining imperativeness. Consequent to picking the cluster head, it impacts use of minor measure of essentialness of sensor to organize and what's more improves the lifetime of the system of sensor arrange. Aggregation of the information got from the cluster people is commitment of cluster head in the cluster. Affirmation of information is done by the cluster head going before the information aggregation if information got isn't honest to goodness by then got information is discarded. Simply affirmed information is taken for aggregation at cluster head. Encryption is done by making use of homomorphic encryption procedure and also encoded information send to the cluster head and information disentangling is performed by base station (BS) for offering end to end security. An ID based stamp system is made for hop by hop authentication. In this paper, we demonstrate the method for recovering the information which is lost in light of the packet surge. In given system cache memory is given by the cluster head to recovery of information mishap. At long last test comes to fruition indicates depending upon parameter like time and furthermore essentialness usage on Jung test system that system showed is incredible appeared differently in relation to the open system.

Keywords : Sensor Nodes, Cluster Head, Base Station, Wireless Sensor Networks, Cache Based System, Hop by hop authentication

A Survey on Various Clustering Algorithms in WSN for Optimal Energy Utilisation

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ABSTRACT

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Wireless sensor networks comprise of an expansive number of distributed sensor gadgets, which are associated and composed through multi-hop steering. Because of the presence of related data and excess in measuring data, data messages can be joined and converged by performing data aggregation work in the steering procedure. To diminish energy utilization is a noteworthy enhancement target of data aggregation approaches, which can be accomplished by diminishing the mandatory correspondence load of steering. To improvise the network lifetime as much as possible in Wireless Sensor Networks (WSNs) the ways for data move are picked in a way that the aggregate energy used along the way is limited. To help high adaptability and better data aggregation, sensor nodes are routinely collected into disjoint, non-covering subsets called clusters. Clusters make various leveled WSNs which consolidate proficient use of constrained assets of sensor nodes and in this manner broadens network lifetime. The objective of this paper is to demonstrate a forefront survey on clustering calculations announced in the writing of WSNs. This paper presents different energy effective clustering calculations in WSNs. From the hypothetical level, an energy show is proposed to approve the advantages of data aggregation on energy utilization. The key parameters which may affect the aggregation execution are additionally examined.

Keywords : Clustering, Load balancing, Fault Tolerance, Latency, Data Aggregation, LEACH, PEGASIS, TEEN, HEED

I. INTRODUCTION

A wireless sensor network comprises of sensor nodes conveyed over a topographical territory for observing physical marvels like temperature, moistness, vibrations, seismic occasions et cetera. Ordinarily, a

sensor hub is a moment gadget that comprises of three parts, for example, a detecting subsystem for data achievement from the physical encompassing condition, a preparing subsystem for neighborhood data handling and capacity and a wireless correspondence subsystem for data transmission.

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Comparative Analysis of Different Image Segmentation Techniques

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Abstract – Image segmentation is vital in understanding and analyzing objects within images. An image may contain over one object and to segment, the image with object features to extract meaningful objects is challenging to the researchers within the field. The method involves in dividing indistinct images into meaningful and useful ones by segmenting them and subsequently evaluating them supported color density. This process is employed within the medical, cultural, industrial fields, and among others. There are many functions utilized in image segmentation, including edge and threshold functions. This paper will compare different sort of image segmentation techniques and can suggest an improved method.

Keywords- Image segmentation.

I-INTRODUCTION

For Detecting objects in images, we have to understand image segmentation. We have to partition or divide the image into various parts called segments. A collection or set of different pixels is called an image. We can make a group together the pixels so that pixels having similar attributes using image segmentation. Image segmentation works like firstly divide the image into segments then we can use the important segments

for processing the image. Image segmentation is technique of division and partition on an image into regions. In that region contains objects, parts of objects or group of objects which appears in the image. There are different types of image segmentation techniques like edge based, pixel based, region based, and model based which partition the image into several parts based on certain image features like color, pixel intensity value, texture, etc. Object detection builds a rough box for each group in the image, it gives nothing about the shape of the objects. We need more information to get our purposes.

Image segmentation methods give a more understanding of the objects in the images, sometimes images are corrupted due to external noise, in that area we have to put down the computational complexity, signal-to-noise ratio, and improve image quality and performance analysis also. The segmentation method is used to identify important regions in medical images, it is a unique technique for partitioning an image into meaningful sub-regions or object with the same attribute [1].

In the medical field, Image segmentation helps in Intra-surgery navigation, Locate tumors and other pathologies, a study of anatomical structure, Measure tissue volumes, Diagnosis, Surgery planning, Virtual

Design of Single Precision Floating Point Arithmetic Unit

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Abstract- Most of the algorithms instigated in FPGAs used to be fixed-point. Floating-point operations are useful for calculations involving large dynamic range, but they require significantly more resources than integer operations. With the current trends in system necessities and available FPGAs, floating-point implementations are becoming more common and designers are increasingly taking benefit of FPGAs as a platform for floating-point implementations. The rapid development in Field- Programmable Gate Array (FPGA) technology makes such devices increasingly attractive for instigating floating-point arithmetic. Associated to Application Specific Integrated Circuits, FPGAs offer reduced development time and costs. Moreover, their suppleness enables field upgrade and variation of hardware to run-time conditions. A 32-bit floating-point arithmetic unit with IEEE 754 Standard has been premeditated using VHDL code and all operations of addition, subtraction, multiplication and division are verified on Xilinx.

Keywords- FPGAs Floating- point implementations , VHDL code etc.

I. INTRODUCTION

The perception of floating-point representation over integer fixed-point numbers, which consist purely of significates that expanding it with the exponent component achieves superior range.

For example, in order, to denote large values, e.g. all 39 decimals are needed to be place down to femtometer-resolution in order to limit the distance between two galaxies. But if the best resolution is presumed in light years, only the 9 most significant decimal digits, where will be of importance as the remaining 30 digits purely carry noise, and thus can be securely avoided. The term floating point actually refers to the fact that a radix points of any number, (decimal point, or, more commonly in computers, binary point) can "float"; denotation that it can be tie up anywhere in relation to the

In current years, Floating-point numbers are widely espoused in many applications due to its high dynamic range and good robustness against quantization errors, capabilities. Floating-point representation is able to recollect its resolution and accuracy. IEEE specified standard for floating-point representation is acknowledged as IEEE 754 standard.

This IEEE 754 standard mandate interchange in arithmetic formats and approaches for binary and decimal floating-point arithmetic in computer programming environments. [IEEE 754- 2008] The main motive of execution of floating-point operation on reconfigurable hardware is to use fewer chip area with less combinational delay [Karan Gumber et.al, May 2012] which means less latency i.e. quicker

Human Voice Controlled Obstacle Avoiding Wheelchair

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ABSTRACT: The main aim of the wheelchair robot is to take human voice as input and process it for the operation according to commands given by the user. This will help us in implementing this technology for the person with physical disability or handicapped ones. Various sensors are used to provide safety to the wheelchair robot from collision by detecting the obstacle in its path.

The voice is given through an android app which transfers to the wheelchair robot via Bluetooth module HC-05. The Bluetooth transfers data serially to the Arduino UNO. The Bluetooth module can communicate up to the range of 100 meters from the wheelchair robot. Arduino reads voice commands and perform desired operation. The motor driver L298D is used to drive DC motors.

Ultrasonic sensor and IR sensor interfaced with the Arduino can help for obstacle detection. This feature can be used for vehicle automation in future.

Keywords: Arduino UNO, Bluetooth module, Ultrasonic sensor, IR sensor, Motor Driver.

INTRODUCTION

As we all know, the world of technology is developing rapidly because of the powerful processor and their mode of communication. The Internet of Things (IoT) is most advanced technology and it is dominating the world because of its integration with the devices such as smartphones and other machines. Because of this integration, the robots can be controlled with lesser direct human intervention.

In the proposed model, the movement of the wheelchair is controlled using voice commands

and android application is used on the user's phone which is connected to the Bluetooth module. The commands are encoded then relayed over an RF (Radio Frequency) channel and before reception they are decoded by Bluetooth module. The Purpose of the wheelchair robot is to respond to the user's commands and act accordingly. The Ultrasonic and IR sensors are most suitable for obstacle detection.

HARDWARE AND SOFTWARE DESIGN

It is a human voice controlled obstacle avoiding wheelchair robot. The wheel chair is specially designed for weak persons or for a handicapped person. It contains two sensors, an Ultrasonic sensor module placed at the front-end of the robot and an IR sensor module placed at the back-end. Both these sensors are used for detecting obstacles in the path. If any obstacle is detected then wheel chair will stop immediately. The wheel chair is based on an Arduino Uno so it is very flexible. We can change its functionality according to the requirements. The code is written in the software which is Arduino Integrated Development Environment (IDE), which is then sent to Arduino Uno. By adding a Bluetooth module, we can control it with our Mobile Phones by giving proper voice commands. For giving these commands wirelessly through Bluetooth we need to install an Arduino Bluetooth Controller smart phone application in our smart phone.



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INTERNET BASED MONITORING SYSTEM FOR SMART KITCHEN

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1. Abstract

The kitchen is very important place in a house. Safety factor is the main aspect that must be taken into account during the activity in the kitchen. The existence of gas leakage, uncontrolled fire and excessive temperatures must be quickly identified and addressed. The purpose of this research is to make prototype of kitchen security system using Internet of Things. The system is designed using 4 types of sensors. IR Flames sensor is used to detect fire, MQ2 sensors are used

to detect gas leakage, and Load cell is used to detect level of grocery items. The sensors output are then connected to the Arduino which will control the relay. The relay acts as a fan switch in the event of a gas leak, uncontrolled fire and excessive temperature increase. Under these conditions, Arduino will also turn on the alarm and the led, and send SMS to the user by GSM module.

2. Keywords

ESP32, GSM 800L, Load cell, MQ2 IoT, Arduino.

3. Introduction

Kitchen environment monitoring is one of the important measures to be closely monitored in real time for safety, security and comfort of people. Every day the modern people expect new device and new technology to simplify their day to day life. The innovators and resembles are always trying to find new things to satisfy the people but the process is still infinite. With the advancements in Internet technologies and Wireless Sensor Networks (WSN), web-enabled systems have offered great convenience and safety that comes with the ability to monitor the status of a smart house and to control Internet appliances

when away from home. This project is compact wireless sensor network with internet capability. The system can monitor the status of kitchen and send alert SMS via GSM network automatically to users. The system has the capability to control through internet, and then the system responds to the corresponding instruction with high security.

Human Resource System Using Python with Django and Machine Learning

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ABSTRACT

Every organization has their own human resources in order to perform the internal and external human resource activities. Among the total human resource activities, managing the human capital i.e. employees is the significant task to any HR. The main function of HR is to recruit, manage and store the employee data which includes their personal information including their Job roles, job streams, projects allotted, salaries and many more which allows them to face huge workload. In order to support the HR's there are some electronic Based HR systems called HRMS human resource management system.

Keyword:HRMS

1.INTRODUCTION

Human Resource Management (HRM) is an operation in companies designed to maximize employee performance in order to meet the employer's strategic goals and objectives. More precisely, HRM focuses on management of people within companies, emphasizing on policies and systems. In short, HRM is the process of recruiting, selecting employees, providing proper orientation and induction, imparting proper training and developing skills. HRM also includes employee assessment like performance appraisal, facilitating proper compensation and benefits, encouragement, maintaining proper relations with labor and with trade unions, and taking care of employee safety, welfare and health by complying with labor laws of the state or country concerned. A human resources management system ensures everyday human resources processes are

manageable and easy to access. It merges human resources as a discipline and, in particular, its basic HR activities and processes with the information technology field, whereas the programming of data processing systems evolved into standardized routines and packages of enterprise resource planning (ERP) software. On the whole, these ERP systems have their origin from software that integrates information from different applications into one universal database. The linkage of its financial and human resource modules through one database is the most important distinction to the individually and proprietarily developed predecessors, which makes this software application both rigid and flexible.

2.SYSTEM MODELING

We have developed Human Resource System Using Python Django And MySQL. The main modules available in this project are Employee types module which manages the functionality of employee type. There is no login form from employee and other user after login admin can add the employee, admin can see the employee details, salary details and also change the password. Admin can edit and delete the details of employee and employee salary. These all things have implemented inside the human resource system.

Smart Restaurant Food Ordering & Billing

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Abstract

The smart restaurant is a concept where a restaurant working is based on using state of the art technology from reservation to ordering and storing customer records. The traditional restaurant system working is replaced by use of smart phones, tablets or graphical user interface interactive touch screens. Customers will order their meal through tablets, so that the order is directly routed to the admin. Also customer's records are permanently maintained in the central server which can be used later for marketing, accounts and sales purposes. The smart restaurant reduces the staff employed for hospitality services thus increasing the profit margins. The kitchen will have an interface where orders will be served according to priority (first come first serve). Official website also help customers to know more about the restaurant and its services, and will facilitate online ordering and prior reservation of table.

1. Introduction

The advancement in technology has greatly influenced the business transactions. The adoption of digital technology has led to automation in the hospitality industry. Business in hospitality industry such as restaurants can be improved with the help of digital systems. The competition in restaurant business have increased with the advancements in food ordering techniques.

This project aims to automate the food ordering and billing process in restaurant as well as to improve the dining experience of customers. Here we discuss about the design & implementation of Smart Restaurant ordering system with real time with customer's feedback for restaurants. The system on user's table will have all the details of his account as well as menu.

2. Literature survey

There is also a development in an interest based application in [1], suggested that the employers/students can place the order by selecting the nearby canteen/cafeteria through the android application pre-installed in their smart phones. The food is served to the designated place by the canteen personals. This will help in saving the time of the employers/students and they can get



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CANCER PREDICTION SYSTEM USING PYTHON WITH DJANGO AND MACHINE LEARNING

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I. ABSTRACT

Cancer is a disease in which certain cells in the body grow uncontrollably and spread to other parts of the body. Cancer can occur in almost any trillion cell parts of the human body. Normally, human cells will grow and multiply when needed by the body (through a process called cell division) to form new cells. As cells age or turn out to be damaged, they die, and new cells update them. Sometimes this orderly process will be disrupted, and abnormal or damaged cells will grow and multiply when they shouldn't. These cells can form tumours and are a tissue mass. Tumours can be malignant or non-malignant. Cancer can also be called malignant tumour. Many cancers form solid tumours, blood cancers such as leukaemia, but this is not the case. After removal, benign tumours usually do not grow, while cancerous tumours sometimes grow. In this project, we will build an algorithm to coach cancer histology image dataset. using Keras, we'll outline a CNN (Convolutional Neural Network), and train it on our images. We will then derive a confusion matrix to investigate the performance of the model and histology is that the study of the microscopic structure of tissues.

II. INDEX TERMS

Cancer, Machine Learning, K-Nearest Neighbor

TensorFlow, Keras, Django, NumPy

III. INTRODUCTION

Cancer is the most familiar cancer in Human of age amongst 41 to 60 and 60+, touching about 10 percent of all Human. In contemporary times, the rate keeps growing and data show that the survival rate is 88 percent after five years from diagnosis and 80 percent after 10

years from diagnosis. Early predictions of Cancer so far have made tons of improvement, death rate of Cancer by 39 percent, starting from 1989. Due to mutable nature of Cancers symptoms, patients are frequently lay open to a bombardment of assessments, comprising but not limited to mammography, ultrasound and surgery, to check their probabilities of being diagnosed with Cancer. Surgery is the most allusive among these events, which consist of intellection of sample cells or tissues for assessment. Numerical topographies, such as radius, texture, perimeter and area, can be distinguished from microscopic images. Data, later on, conquered from FNA are studied in grouping with different imaging data to prophesy probability of the patient having spiteful Cancer tumour. A computerized system here would be colossally profitable in this situation. It will possibly speed up the process and enhance the meticulousness of the doctor's predictions. In addition, if supported by plethora dataset and the computerized system dependably carry out well, it will conceivably disregard the necessities for patients to go through copious of other tests, such as mammography, ultrasound, and MRI, which focus patients to major extent of soreness and radiation. In all, an early calculation remains is one of the vigorous features in the follow-up process. Data extracting techniques or sorting can help to lessen the number of false positive and false negative assessments. As a result, a new method like data discovery in databases has become a preferential implement for medical assistant.

Given the significance of customized medicine and the escalating idea on the application of ML techniques, we here present an analysis of readings that make use of these methodologies on the issues

of the cancer prediction. In these readings predictive topographies are measured which may be autonomous of a convinced treatment or are combined in order to attend dealing for cancer patients, respectively. In addition, we discuss the types of ML techniques being used, the

Multi-Level Marketing with Grocery System Using Python with Django & Machine Learning

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Abstract - Online grocery business is at emerging stage in India. Online retailers need to analyze different factors that affect consumers purchase intentions towards online grocery shopping. It is also observed that buying behavior of consumers for online grocery shopping is totally different than buying from physical markets. Online grocery model fulfills consumers' need and help them to save their time and effort. The purpose of this paper is to throw a light on different types of e commerce models. The paper also tries to understand the demographic profile of the customers who groceries through online mode, reason to purchase groceries online and satisfaction level of customers buying groceries online.

Keywords -Online Grocery, Consumer, e-retailing, Shopping.

INTRODUCTION: generations who are accustomed to buying groceries from brick-and-mortar stores. The grocery shoppers of new age A significant role is played by the internet in connecting to are identified as better educated and risk-taking individuals information and people. Internet has significantly helped who try new things and opt for easier solutions to problems. shortening the distance between people and their prospects, hence given birth to online services and ventures. Online From the research related to internet usage of people, shopping is trending in the world giving increased output findings conclude that complex decision making of every year. Grocery products include the edible consumers is based on the social cognition of individuals. commodities that are purchased often or on continuous This research study aims at identifying the key factors that basis from supermarkets, usually at regular intervals of tend to increase the adoption of online grocery, what time. Traditionally, groceries are bought in set-up where consumers want from a grocery store and what are their the consumer can inspect the product before buying. current attitudes towards the concept. Furthermore, the research aims to identify the pain points of consumers that Online grocery trade has a lot of potential as Generation need to be catered to increase online grocery shopping and their predecessors use technology frequently to save adaptability. time and seek convenience as compared to the previous

The past few years have seen a tremendous growth in e- leaders and laggards in various industries. India's commerce. Use of online platforms to seen goods and hyperlocal e-grocery market is growing at triple-digit rates, services has created a differentiation between the market with sector specialists continuing to lead the market.

LITERATURE SURVEY: participation, it is necessary to explore and analyze the connection between customer satisfaction and As per journal publisher Nebojsa Vasic, Milorad diverse determinants. Accordingly, this paper Kilibarda, Tanja Kaurin Consumer satisfaction with develops the research model to determine the impact online shopping is directly dependent on a number of of certain online purchase determinants on the consumer factors. There is a constant dilemma in the market satisfaction in the market of Serbia. related to the question which online shopping

determinants affect the customer satisfaction. This As per publisher global journals contains a brief issue is particularly important for underdeveloped discussion of search engine marketing or e-commerce, literature survey, current and future prospect, comparative markets, where online commerce is not sufficiently study of e-commerce in Bangladesh perspective on online present. In order to increase the online commerce



Live College Classes & Assessment based System

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Abstract: Online learning is an educational process which takes place over the Internet as a form of distance education. Distance education became ubiquitous as a result of the COVID-19 pandemic during 2020. Because of these circumstances, online teaching and learning had an indispensable role in early childhood education programs. Online teaching experiences provide teachers with opportunities to interact with children, as well as to encourage reflection on how best to promote young children's development and learning with online communication tools. During the COVID-19 pandemic, academic institutions are promptly shifting all educational activities to the e-learning format. The present work describes concurrent procedures for online teaching and assessment performed at the school and college. We also explored the impact of e-learning and assessment on the performance of students and faculty, and the challenges to their sustainability.

Keywords: Distance education, Computer conferencing, Global education.

I. INTRODUCTION

Online learning is one of the new innovative study methods that have been introduced. Students can now learn remotely using the internet and computers. Online learning comes in many forms and has been developing with the introduction of new technologies. Most of the universities, high schools and other institutions in the world have this form of learning. There are considerable differences between the online learning and classroom learning. In online learning teachers and students don't meet physically as opposed to the classroom where teachers and students interact physically. This project is based on the problems we are facing for the online live classes and assessment. The structure of an online classroom varies. But generally online students regularly login to a learning management to a system. A virtual portal where they can view the syllabus and grade; contact professors, classmates and support services; access course materials and monitor their progress on lessons. An Assessment tool that allows teachers to provide students with regular and immediate feedback rather than retrospective, manicured report about student progress.

II. LITRATURELITRATURE REVIEW

- 1) *By Maria Kallia:* The purpose of the literature review is to outline research studies in the assessment of computing courses and to highlight the studies that can be used in the assessment of school computing. The main objective is to summaries what is currently known about the effective assessment of computer science courses and to identify gaps in knowledge.
- 2) *By Jessica wode and Jonathan Keiser:* Using reminder e-mails from instructors and messages posted on online class discussions can significantly increase response rates. Students leave more comments on online evaluation compared to paper evaluations. Students, faculty, and staff generally view online evaluations more positively than paper evolutions.
- 3) *By Kristen DiCarlo and Lori Cooper:* Effective classroom assessment techniques are directly linked to course objectives and proposed outcomes. Results within formative and summative assessments have been studied in the online learning environment as educators seek to meet objectives with respect to student success in the non-traditional setting. The purpose of this literature review is to present the goals, findings, limitations, and recommendations associated with various studies regarding classroom assessments techniques and their effectiveness in the online classroom.

III. PROPOSEDD APPROACH

Certain goals regarding the efficiency of the project to be developed were also proposed, which are as follows:

- 1) *Planned Approach:* The working of the website is well planned and organized. The data will be stored properly in data stores, which will help in the retrieval of information as well as its storage.
- 2) *Accuracy:* The level of accuracy in the proposed system will be higher. All operations would be done correctly and it ensures that whatever information is retrieved or stored is accurate.
- 3) *Reliability:* The reliability of the proposed system will be high due to the above stated reasons. The reason for the increased reliability of the system is that now there would be proper storage of information.
- 4) *No Redundancy:* In the proposed system utmost care would be taken so that no information is repeated anywhere, in storage or otherwise. This would assure the economic use of storage space and consistency in the data stored.

Doctor Patient Portal for Healthcare

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ABSTRACT: Today's life has become so diligent, no one has time to waste it on diminutive things and for that technology has become the puissance. Android Apps are very easy to operate in today's world, even diminutive kids can operate mobile contrivances and hence we have developed an android and web-predicated portal for medicos and patients. This portal will avail patients to directly communicate with the medicos registered on this portal and take exhortation, book appointment, contact to specialist, etc. The portal is divided into 2 modules. The first one is a web application for the doctors and an android application for users or patients. Both the modules have their own specialization and features.

KEYWORDS: doctors, patients, web-portal, android app, server, appointment, payment gateway, health care.

I. INTRODUCTION

Medico-Patient Portal is an Android app that establishes online communication between a medico and a patient. This app is subsidiary to patients to ask questions and verbalize their concerns to medicos regarding their health condition. This app will facilitate the patients to interact with medicos without making any physical appointments. In addition, utilizing this app, the patient can make an appointment to meet the medic in the clinic/hospital.

Medico-Patient Portal has unique features such as issuing an online prescription to patients, referring patients to a specialist, sending health tips to patients, and efficiently, truncating the cost of customer accommodation, and providing a vital communication link between medicos and patients.

This portal will avail patients to directly communicate with the medicos registered on this portal and take exhortation, book appointment,

contact to specialist, etc. The portal is divided into 2 modules. The first one is a web application for the doctors and an android application for users or patients. Both the modules have their own specialization and features.

II. LITERATURE REVIEW

1. The system is predicated on hospitality and healthcare. Paper proposed by Imteaj Zafar et al. proposes an android application system for both medicos and patients for the hospitality management.
- 2 Smartphone-predicated patient monitoring system for healthcare proposed by Meena Joseph denominated "DPP", which manages all the records regarding patient's history and their prescriptions.
3. "Health Plus" is a web-predicated portal developed by Harish Chabadiya it has three modules that can be operated discreetly. It is for booking appointments, maintaining records, etc.

Health Care Patient Monitoring System Using Raspberry Pi

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ABSTRACT

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Health has become one of the global challenges for humanity. Cardiac diseases, Lung failures and heart related diseases are increasing at a rapid rate. Monitoring health of elderly people at home or patients at hospitals is necessary but it requires constant observation of Practitioners and Doctors. Information Technology (IT) and its growing applications are performing major role in making human life easier. Internet of Things (IoT) is transforming healthcare and the role of IT in healthcare. IoT consists of physical devices, such as sensors and monitoring devices for patients (glucose, blood pressure, heart rate & activity monitoring, etc) to connect to the internet and transforms information from the physical world into the digital world. The proposed system, with the help of IoT's such features, will help to keep the necessary details and reports of a patient organized and available to all actors in the system. IoT devices like low power sensors will be used to collect data from patients and it will be displayed using LCD and stored on any personal computer and also on the cloud so that any actor in the system can refer to it.

Keywords : Internet of Things (IoT), Remote health, System on a chip (SoC), MQTT (Message Queuing Telemetry Transport) protocol

I. INTRODUCTION

Internet of things, as the name suggests, is a 'network of things' or in more particular context 'network of devices' (having some intelligence) that are connected together to achieve some excellence in the performance of the entire system. Devices in the network have unique identities so that it is easy to use them and to manage the entire network. Gartner's definition of IoT is - "The Internet of Things (IoT) is the network of physical objects that contain embedded technology to communicate and sense or

interact with their internal states or the external environment."

Objects in IoT refers to any type of object, it can be a smart device with more artificial intelligence which can communicate with other objects very efficiently or it can be a dumb object which does not have any communication capabilities. Objects with communication capabilities become communicating nodes. Hence IoT is not only the concept of hardware or software, it also considers the interaction between the objects. IoT networks have the huge amount of data.

3.3.2

FY

20-21/01

Study of Thermoluminescence Dosimetric Properties of Submicron BaSO₄ Phosphor

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Abstract: Dosimetric properties of submicron BaSO₄:Eu phosphor have been studied. Top down approach (ball milling) has been adopted to reduce the grain size of the material to submicron level. Phosphor showed good thermoluminescence (TL) properties. The TL properties of the phosphor were altered due to the particle size reduction on ball milling. Ball milling affected the kinetics of TL Processes. TL dose response of the phosphor has been linearly increased upto 4 kGy on ball milling which makes it useful in high dose dosimetric applications.

INTRODUCTION

Rare earth doped BaSO₄ was firstly reported by Dixon et al in 1974 [1]. Out of several doped samples, intense thermoluminescence (TL) was observed in Tb and Eu doped samples. Yamashita et al. [2] and other researchers [3,4] also studied thermoluminescence and photoluminescence (PL) of Eu doped BaSO₄. They confirmed that Eu enters BaSO₄ lattice in Eu²⁺ state. TL emission spectra in these samples are similar to PL spectra of Eu²⁺ which indicates that Eu²⁺ acts as a center for emission in TL process. Atone et al. [5] made BaSO₄:Eu by co-precipitation method and annealed the precipitate at 973 K in air. The TL peak was observed at 450 K but its sensitivity to gamma rays was found to be 3.5 times less than that of CaSO₄:Dy. Shinde et al. synthesized and characterized BaSO₄:Eu,P phosphor as highly sensitive TL dosimeter [6]. BaSO₄:Eu phosphor was also developed by Madhusoodanan et al. [7, 8] using co-precipitation technique and solid state reaction with TL sensitivity higher than that of CaSO₄:Dy. However the sample exhibited fading due to presence of lower temperature peak. Recently Bhatt and et al. [9] reported the thermoluminescence and optically stimulated luminescence (OSL) of BaSO₄:Eu. P.R. González et al. [10] reported the thermoluminescence properties of Eu doped BaSO₄ at different concentrations. They have also investigated the kinetic parameters such as activation energy, the frequency factor, the pre-exponential factor and the kinetic order by initial-rise and deconvolution methods. Kinetic parameters of the TL curve of BaSO₄ doped with Eu and Dy were also investigated by Y. Rangeela Devi and Dorendrajit Singh using computerized glow curve deconvolution (CGCD) method [11].

Nanoparticles of BaSO₄:Eu with grain size in the range of 30-50 nm were prepared by Numan Salah et al [12] by the chemical co-precipitation method. Thermoluminescence glow curve of these BaSO₄:Eu nanoparticles was studied and found to exhibit a linear/sublinear TL response to gamma radiation over a very wide range of exposures.

In this work efforts were made to increase the dose linearity of the phosphor to the wide dose range of gamma exposure. For this a top down approach (ball milling) was employed to reduce the size of the material to submicron level. The TL results on submicron Eu doped BaSO₄ phosphor are reported. We investigated that the linearity of dose

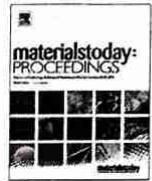
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Numerical simulation and performance analysis of InGaP, GaAs, Ge single junction and InGaP/GaAs/Ge triple junction solar cells

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ABSTRACT

Recent trends in the field of solar cells show that Multi-junction III-V semiconductor solar cells are an attractive option because of their high efficiency and cost effectiveness. As the first step to develop an InGaP/GaAs/Ge triple junction solar cell, we first simulated three individual InGaP, GaAs and Ge single junction solar cells using Silvaco ATLAS Software and obtained the efficiency of 13.42%, 12.99%, 3.37% for each cell respectively. Further in order to increase the efficiency of solar cell, we numerically simulated the InGaP/GaAs/Ge triple Junction solar cell by stacking InGaP, GaAs and Ge single junction solar cells and achieved high efficiency of 29.78%. The current-voltage curve, power-voltage curves and solar cell performance parameters and spectral response of each single junction solar cell as well as performance parameters and spectral response of InGaP/GaAs/Ge triple Junction solar cell have been extracted and analysed in detail. The aim of the study is to contribute to the investigation for experimental research work on the improvement of efficiency of InGaP/GaAs/Ge triple junction solar cell, through the numerical simulation, Since systematic cost of experimental investigation of the solar cell is very high and also it requires large time therefore technology computer aided design (TCAD) based simulation and performance optimization of the solar cells is important.

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1. Introduction

Stacked multi-junction solar cells fabricated from III to V monolithic semiconductor materials, such as lattice-matched InGaP/GaAs/Ge triple-junction solar cells have been developed to achieve power conversion efficiencies higher than 50% for terrestrial and space applications [1-3]. Multi junction solar cell consists of stacked p-n junctions with different band-gap energies and can absorb wide range of the solar spectrum [4,5]. In these III-V monolithic semiconductor multi junction cell, each sub cell absorbs sunlight at a specific wavelength region of the solar spectrum and converts it to electricity.

The production and optimization of multi junction solar cell is too expensive and time consuming, as the processes required to

fabricate and optimize the cell may have to be repeated until the desired results achieved. Literature survey shows that alternatively, researchers have used different simulation tools and mathematical models to optimize, to study the characteristics and to improve the performance parameters of different types of devices e.g. multi junction solar cell [6,7], photo detectors [8,9], organic solar cell [10], single junction hydrogenated amorphous silicon solar cell [11] etc.

Since systematic cost of experimental investigation of the semiconductor devices e.g. solar cell is very high and also it requires large time therefor technology computer aided design (TCAD) based simulation and performance optimization of the solar cells is becoming very important. Therefore in this work we present the technology computer aided design (TCAD) based simulation and performance optimization of InGaP, GaAs and Ge based single junction solar cells and triple junction InGaP/GaAs/Ge solar cell. Also we extracted the performance parameters e.g. open circuit voltage, short circuit current, maximum power point voltage

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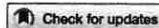
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Study of thermoluminescence and trapping parameter evaluation of $K_3Ca_2(SO_4)_3F: Mn^{2+}$ phosphor in perspective of TLD application

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ABSTRACT

The series of Mn^{2+} single doped fluoride-based $K_3Ca_2(SO_4)_3F$ phosphor was prepared by the conventional high temperature solid-state reaction method. The formation of phase purity and morphology was studied by the XRD and SEM analyses. The prepared material was irradiated by γ -rays from ^{60}Co source and the thermoluminescence (TL) characteristic was carried out by Nucleonix 1009I TL reader. The prominent TL dosimetry peak observed for $K_3Ca_2(SO_4)_3F: 1\text{mol}\% Mn^{2+}$, annealed at $800^\circ C$ centred at $217^\circ C$, revealed deeper traps. The TL exhibits a linear response as a function of dose rate up to 4 kGy. The computerised glow curve deconvolution (GCD) method, employed for the analysis of TL glow curve, shows the kinetics of the first order. The trapping parameters were evaluated using Chen's peak shape method, initial rise method and Ilich method. The results exhibit that the synthesised phosphor was found to be a potential candidate for radiation dosimetry applications.

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KEYWORDS

Phosphor; radiation dosimetry; trapping parameter; glow curve; exposure

1. Introduction

The phenomenon of light emission from crystalline materials, such as semiconductor or insulator, under heat treatment on previously irradiated material by highly ionising radiations, is described as thermoluminescence (1). The radioactive radiations, which are commonly applicable in the medical or nuclear field, show a hazardous effect on human beings and hence there is a serious need for the monitoring of radiation doses. Several technical methods for radiation detection, such as ionisation chamber, GM counter, etc., were used; however, among them TLD phosphor revealed promising applications over this owing to their enormous characteristics such as their smaller size, cost effective, ease in handling and fast readouts. Recently thermoluminescence dosimetry (TLD) received more attention in various areas such as environmental issues, industries as well as medical applications and protection. The thermoluminescence materials revealed excellent susceptibility for both personal and environmental monitoring, available in considerable smaller in size and hence easily adaptable for both manual and automatic processes, also these materials revealed

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20-21/04

Synthesis and photoluminescence properties of novel red-emitting $\text{KMg}_4(\text{PO}_4)_3: \text{Eu}^{3+}$ phosphors for UV- excited white-light emitting diodes

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Abstract. The trivalent Eu^{3+} activated $\text{KMg}_4(\text{PO}_4)_3$ phosphor has been successfully prepared via solid state diffusion technique. The phase formation and structural morphological studies carried out by XRD pattern and SEM analysis. The photoluminescence excitation spectra centred at 395 nm attributed to ${}^7\text{F}_0 \rightarrow {}^5\text{L}_6$ energy transition levels. PL emission spectra centred at 593 nm and 613 nm corresponds to ${}^5\text{D}_0 \rightarrow {}^7\text{F}_J$ ($J=1,2$) transitions of Eu^{3+} in the host respectively. The experimental results showed that Eu^{3+} singly doped $\text{KMg}_4(\text{PO}_4)_3$ phosphor under UV excitation gives intense red emissions. The critical Eu^{3+} quenching concentration (QC) was determined to be 1.0 mol% along with excellent CIE coordinates of (0.6326, 0.3670). All the above results exhibits, the prepared phosphor is promising material as UV excitable red emitting phosphor for w-LED.

Keywords: Phosphor; Down conversion; Luminescence; Chromaticity coordinates; W-LEDs

1. Introduction

In the recent year trivalent rare-earth (RE^{3+}) ions doped inorganic based phosphor received more attention as luminescent materials owing to their wide application in the various field such as w-LEDs, medical applications, non-inversion thermometry, solar energy conversion, temperature sensors, field emission displays and solid state lighting (SSL), due to existence of emissions attributes to electronic transitions in the $4f_n$ configurations [1–3]. In the present era energy saving is the prime issue and hence major inclination towards w-LEDs in display technology owing to its excellent performance, low power consumption, durability, high compatibility, energy saving, as well as are of highly economical [4,5]. In order to realize the excellent luminescent materials, it must exhibits some important characteristics such as prominent emission efficiency under n-UV/blue excitation, good thermal and chemical stability as well as narrow band emission with good absorption. In general two approach are adopted to achieve p-w-LEDs include (i) combination of yellow emitting (YAG: Ce^{3+}) phosphor with blue emitting (InGaN) chip but owing to lack of red emission it shows high CCT and poor CRI which hinder its commercialization. (ii) This limitation can be overcome with the approach of combination of RGB phosphor with n-UV or blue excitation chip to improve the optical properties [6]. The poor thermal stabilities and aging rates of the different phosphors also restrict their applications in w-LEDs [7,8]. Moreover, various components of inorganic luminescent phosphor materials encompass with borates [9], Aluminate [10], vanadates [11], tungstates [12], silicates [13] and phosphates [14] have been studied for generation of



20-21/05



Bio-waste lemon peel derived carbon based electrode in perspect of supercapacitor

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ABSTRACT

The delicate hierarchical structure of bio-waste is a cost-effective route to develop rational nanostructures for high-performance energy storage device. Bio-waste carbon materials receive extensive attention owing to their excellent physio-chemical properties and economic values. Herein, we demonstrate the facile route for the synthesis of porous carbon material from bio-waste without any physical/chemical activation and studied for supercapacitor application. The synthesized carbon materials exhibit a highest specific capacitance of 121 F g⁻¹ at 1 A g⁻¹ in three electrode system and 106 F g⁻¹ in symmetric device at current density of 0.2 A g⁻¹ with specific energy 11.84 Wh kg⁻¹ and specific power of 361.8 W kg⁻¹ with cyclic stability of 100% over 1000 cycles in device configuration. The effect of pyrolysis temperature with exclusion of the activation on the electrochemical performance is elaborated and hence the rational design of economic biomass-derived carbon material is studied for supercapacitor application.

1 Introduction

Rapid depletion of fossil fuel reserves, hike in oil prices, increase in power demand and climate change due to global warming leads to the development of renewable, eco-friendly, reliable and sustainable energy storage system [1, 2]. This provoked more research interest towards generation electrochemical energy storage device as a substitute for power source, like batteries, fuel cell and capacitor [3]. Supercapacitor (SC) also known as ultracapacitor receive promising attention in the energy storage

system due to its unique characteristics like ultrahigh power density, rapid charging-discharging process and long stable performance etc., hence exhibits potential application ranging from mobile device to electrical vehicles[4, 5]. In general SC occupies the region between conventional dielectric capacitors and batteries [6–10]. On the basis of charge storage phenomenon, SC is broadly categorised into electric double layer capacitors (EDLCs) [11, 12] and pseudocapacitor [13, 14]. Energy storage in pseudocapacitor is due to fast faradic redox reaction such as electrosorption, intercalation process and oxidation

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A factor analytical study of scores obtained by B.Ed. students of Nagpur region in theory papers

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Abstract: In this paper, the study will be conducted to examine whether there is any communality among the marks obtained by B.Ed. examinees in various papers of this course since there are three major streams into which B.Ed. students are channeled. [1,2] The marks obtained by the examinees in three streams will be studied separately. The three streams are Arts, Commerce and Science even though the B.Ed. courses are open to all University graduates including B.Sc., Agriculture, B.E., B. Tech, and M.B.B.S. However, there are few instances all over the country where B.E., B. Tech, M.B.B.S. degree holders seek and get admission in B.Ed. courses. Thus the marks obtained by B.Ed. examinees belonging to the three streams in 2016-17, 2017-18, 2018-19 in R T M Nagpur University were subjected to factor analysis. While discussing the scope of the present work, it is essential to mention that the factor analysis is one of the advanced procedures of statistical analysis of the data. The marks obtained by the examinees in each of the said streams for every year separately are factorially analyzed and interpreted.

Keywords: factor analysis, two factor theory, correlation matrix, reliability, correlation.

1. Introduction

When we study Statistics we know it consists of the procedures which are used to explain certain phenomena. These procedures are based on mathematical logic. Factor analysis is one such technique. The first major attempt leading to the basic idea of factor analysis was made by Spearman (1904). Spearman on the basis of his study of relationship in various constituents of general intelligence reached the conclusion that intelligence is constituted of two factors 'g' and 's' and he proved his theory by analyzing the correlation matrix. His conclusion that the common element is identical in all tests involving the process of cognition. Every test, then, he thought to be composed of the g factor, which is universal, plus a specific factor that is found in each test alone. [3, 4, 5]

Objective of the problem:

To find out the common factors in contents of course of B.Ed. from marks obtained by students in their theory papers.

1.1 Analysis and Interpretation

A closure examination of the statement of the problem makes it obvious that the data for the present study constitute of the marks obtained by B.Ed. students in theory papers.

The objectives of the study as already stated make it clear that, It is an examination which all the students from all the affiliated colleges of education have to appear in.



20-21/08

Analytical study on impact strength of steel fibre reinforced concrete

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Abstract. In Recent years, there has been an increasing tendency to build resilience to the impact of civilian and military infrastructure due to the increasing number of attacks or calamities. An alternative solution is to improve the impact resistance of such structures is to incorporate different types and dosages of fibres into the concrete that can greatly reduce the damage of concrete structures due to the impact load. This research work focuses on the experimental setup based on Drop Weight Test-Ac1 544. The objective is to build a model for impact energy using variation in plain concrete and fibre reinforced concrete. Furthermore, this research work investigates and describes the impact resistance of fibre reinforced concrete to calculate the reliability of model. Lastly this analytical study is based on testing an experimental model using various mathematical and statistical methods.
Keywords Fibre reinforced concrete, Reliability function, Statistical methods.

1. Introduction

The impact strength of concrete can be measured by the drop-weight test due to its simplicity and attractive method, as recommended by the ACI Committee 544. The real facts resemble a huge deviation under this test. Some of the reasons for this are-

- First crack are put under visual recognition and accordingly the test results are interpreted. One fact which can be observed is that the crack can occur in any direction which can affect the end result.
- The manual approach of dropping the hammer from an exact height is beyond control.
- Tough crude aggregate, fibre or matrix play an important role in determining the single point impact for resistance of concrete.
- A heterogeneous mix material is used for making the concrete can also cause the variation for the drop-weight test result.

The amount of deviation in impact resistance affect the shape of aggregate, distribution of fibres, its geometry etc. that may be due to the variation in the mix design. The end results of the impact experimental test using steel fibre in concrete can be analyzed using the proper statistical tests.



20-21/09

A Numerical Analysis of Green Sustainable Concrete ANOVA

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Abstract: Significant studies were undertaken on the use and impact on tensile along with compressive concrete aggregate (RAC). However, the combined result of recycled aggregate and fly ash (FA) strength of concrete has not been modelled properly. To contribute to this area, research was carried out. Fly ash and substitution per cent of natural coarse aggregates by recycled aggregates along with different percentages. This study determines whether the numerical analysis can be performed on the experimental values. Checking normality, one-way analysis of variance (ANOVA) is used as working method. The prediction is trained and tested upon the available experimental data sets. Thus, the research work briefs about statistical methods and the corresponding result analysis. The linear relationship between the Compressive strength without fly ash provides the reliability of the model. 90 days Compressive and Tensile strength at 10% FA provides the best choice among all and can be further optimized on its various combinations.

Keywords: Recycled Aggregate in Concrete (RAC), Fly Ash (FA), Compressive Strength, Tensile Strength, Reliability, Normality Test by Shapiro-Wilk.

1. Introduction

Every year, the building and demolition industry generates large quantities of waste. Recycled aggregate is combined with natural aggregate once utilized in new concrete (PRA). Natural resource scarcity may be a growing problem for the world, and it is important to address the present deficiency and take the step to conserve an atmosphere. To reduce this waste, construction and demolition wastes in concrete mixtures as a substitute for Natural aggregates (RA), that may be utilized as aggregates into concrete, are often generated by concrete waste (Limbachiy et al., 2012). Concrete utilization gains importance, as a result of resources associated with it and it removes requirement of discarding via concrete waste in a brand spanning newer concrete or alternative applications. Recycled aggregate concrete in a manner as typical concrete. Special care is needed when using fine RCA. Solely up to ten percent is useful.

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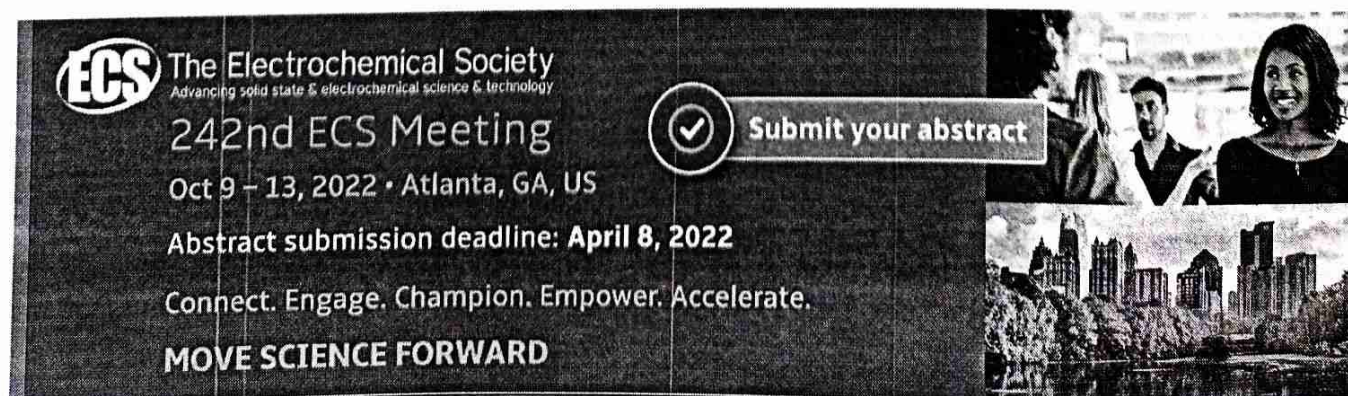
A factor analytical study of scores obtained by B.Ed. students of Nagpur region in theory papers

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MATHEMATICAL MODELING OF WORKERS ACTIVITY DURING PLANT SHUTDOWN-STARTUP ACTIVITIES WITHIN THE FRAMEWORK OF COOPERATIVE GAME THEORY

20-21/11

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Abstract: In every kind of industry to have esteemed production in limited time and cost marks its capital gain. It may be any section of the industry, such as technical, mechanical, human resource or sales, all are co-related with the end products a factory produces to be marketed off in the world spectrum. This paper reflects a short and applicable method to overcome the difficulties arising in the all-around production of goods in industries when time and capital are limited. In simple terms, this model formatted on games theory (n - person cooperative games). Lastly, for more illustration, a case study is posted to explain the issues with examples for better understanding of Shapely value and the concept of the nucleolus. All departments of a production house can benefit equally.

Keywords: Game theory, project management, employee, cost allocation

1. INTRODUCTION

Cooperative game theory assumes that groups of players, called coalitions, are the primary units of decision-making, and may enforce cooperative behaviour. Consequently, cooperative games can be seen as a competition between coalitions of players, rather than between individual players. The basic assumption in cooperative game theory is that the grand coalition that is the group consisting of all players will form. One of the main research questions in cooperative game theory is how to allocate in some fairway the payoff of the grand coalition among the players. The answer to this question is related to a solution concept which, roughly speaking, is a vector that represents the allocation to each player. Different solution concepts based on different notions of fairness have been proposed in the cooperative game theory literature. At present, the division has fully believed in non-cooperative aspects and to format dynamic surroundings to dissolve any problems arising to diminish the productivity of any kind of industry. Time cost trade-off is totally effective in reducing the cost of production, labour charges and cost of material whereas time management aspect helps in producing the products of desirable quality in less time. It is generally believed that less the value of the raw materials and other initial expenses, time is taken to finish off the project will be higher. They were putting practical use of Critical Path Method (CPM) as it is widely known, minimising the cost for non-essential activities eventfully, which will lead the projects to finish in the proposed time. Today heuristics commonly termed as mathematical programming is widely worked out for time-cost trade-off analysis which proves inefficient to bigger scale CPM networks. Few programs like analogous to natural selection, genetics in reproduction and genetic algorithm have proved to dissolve a large number of problems arising in the scientific and mechanical arena. Feng [2] formatted an algorithm revolving around the principles of genetic algorithms (GA) for designing the methodology. In other programs, Feng [3] has done initiative representation process essential for verifying stochastic effects. Even then, a common strategy algorithm will be quite useful to give the right direction to possess favourable solutions. Ho [7] researched the effects of bid compensation for further improving the rightful bid compensation process to verify the comparative relation between competing bidders and project filers. The model evolved during this research revolves around bid compensation aided with equilibrium compensation, quantitative formula and qualitative usage. Ho [8] analysed theoretic foundations for the effective applicable common and private partnership procurements and management strategies for decision. It can be rightly stated that the study is an innovative step to design a framework and systematic workout to estimate the working motions. Recently, Ho [9] verified by scanning the primary characteristic pattern of the participants if get indulged in opposite unexpected goals in unfavourable conditions. The study states that when the end result is more profitable than initiative capital loss, the players are mentally unprepared to meet the challenges, which may create quite potential problems to achieve the desired goal in a fixed time. Medda [10] put forward a structure to aid formwork subcontractors to hire daily wages open workers in place of workers related to the Union. They can earn considerable gain as the labour cost will be less and can surely complete the proposed works in the given time. This is sure to help in increasing their capacity to complete the project at less cost, hence gain more contracts eventually. Payoff process is well materialised for single contractors as well as a group of contractors. The profit can be equally distributed among the collaborated contractors by utilising the Shapely Value and nucleolus. Shen [14]

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20-21/12

Modified Newtonian Dynamics with Higher Derivative Lagrangian

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ABSTRACT

In light of the interest in the MOND theories of gravity we construct a nondegenerate higher derivative Lagrangian that recovers Milgram's dynamics and that still lead to workable equations of motion. A discussion is given of some simple familiar dynamical systems. Euler-Ostrogradsky equation for these systems are solved for high acceleration and low acceleration regimes. Newtonian and MOND's equation of motion are obtained respectively. We also find there solution. The resulting Newtonian and MOND analogues and there solutions are compare.

Key Words: Euler-Ostrogradsky equation, Kinetic energy, Lagrangian, Potential energy, MOND, Newtonian Regime, MOND Regime, Nondegeneracy, Simple Harmonic Oscillator, Simple Pendulum.

I. INTRODUCTION

Earlier in 1937, the velocity dispersion of the Coma cluster of galaxies is measured by the Swiss astronomer Zwicky, astronomers by any means whatsoever got familiar with the sense that the universe is filled by some kind of dark matter. The stars velocities which are away from the centre, in spiral galaxies are much faster than slated. The stars at great distances from galactic centre spinning faster and faster the more powerful the centrifugal force. If the galaxy mass is estimated by counting up all the stars, there is no balance between the gravitational force and the centrifugal force related with these fast stars. This advocate that there is a lot more to the galaxy than that meets the eye, we name this unseen matter as dark matter. When Kepler's laws are kept, the dynamical masses of spiral galaxies should be much larger than their baryonic masses. Normally

balance between gravity and an effective centrifugal force governs the circular motion. In the wake of more or less a century of study, it is to be noticed that dark matter, a nonluminous form of matter be present in the outskirts of galaxies is made of novelty that link with ordinary matter only by gravitation [1,2]. The observations make powerful correlation among asymptotic velocities in the outer region of different types of galaxies and their baryonic masses, which can be fit by introducing a single parameter: a constant of the dimentions of an acceleration scale of order [3]. In the recent decades some modifications of the law of gravity have been suggested by many researchers to stay away from the demand for dark matter. One of the successful and that survived observational tests is the Modified Newtonian Dynamics (MOND). MOND predicate a breakdown of Newton's law of gravity (or inertia) in the limit of small a very low a_0 , in the high acceleration regime

Synthesis of Novel adhesive for Bamboo Joinery and comparison of its Mechanical Properties with adhesives available in the Market

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Abstract

In this study, novel adhesive applicable for bamboo joinery has been synthesized using liquefied bamboo (Timber Bamboo) as an alternative to traditional phenol formaldehyde resins. The most objective of this work is to test the feasibility of using liquefied bamboo as stuff for the synthesis of Adhesive. The newly synthesized adhesive was analyzed for its physico-chemical parameters and mechanical properties using different bamboo species and was compared with those of adhesives available within the market. Mechanical properties like tensile strength, compressive strength and shear strength were tested on different samples of bamboo species using newly synthesized adhesive and the adhesives available within the market. The tests were administrated on Universal Testing Machine at room temperature. The results showed that the most values for mechanical properties were obtained when Asian Paints (Loctite touch) was used as an adhesive.

Keywords: *Adhesive, Bending strength, Compressive strength, Mechanical properties, Tensile strength, Shear strength*

1. Introduction

Bamboo can be harvested in 3-4 years from the time of the plantation and this is the principal reason for replacement of wood by bamboo [1][2]. "Bamboo being a non wood lignocellulosic

20-21/15

Techniques of Getting Proficiency for Cracking off Interview

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Abstract: It has often been discerned that for getting recruited in any organization or company, the candidate has to go through certain questions which grades him/her for the capability he/she owns. Some graduates from engineering and technology are not having the same quality of education compared to others from countries which are advanced (Dhruba Borah et al., 2019), hence with the help of interview process the interviewer scrutinizes the interviewee's knowledge. In today's era getting job for the person totally depends on how the latter performed in interview. Many a times, it has been seen that although the jobseeker has the knowledge but couldn't show the same during interview which marks bad impact and he fails to get a good job. This paper is going to give certain tips and techniques to face an interview, so that the jobseeker is often confident and ready for facing any sort of interview they come across with. The paper also discussed some basic questions asked in interview and also suggested the expected answers for the same. According to sir *Kim-Daniel Vattoy*, (2020) for expressing any view, the person must be efficient enough with good command on communication, hence the communication should also be taken in good accordance.

Key Words: Interview Techniques, Polished Vocabulary, Apt Gesture, Voice Modulation

1. Introduction: The word *interview* is derived from the old French word *entrevue*. Interview is defined as the discussion which is formally done to judge the capability of an applicant for giving them the job. Here, the interviewer is the one who asks the question in the interview and interviewee is the one who answers the questions. The companies or organizations not only do concentrate on profit but the quality work with the expectation of society should also come forward (Marcelo Werneck Barbosa et al., 2020), therefore interview is considered as the most important part for any business or organisation, as interview is that stage where the person is scrutinized for being perfect in the job which indeed matters for the development of the organization or for any entrepreneurship. Sometimes the interview also gets conducted virtually. (Joung Huem Kwon, 2013) has mentioned about the reduction in anxiety due to virtual interview.

2. There are certain techniques to face an interview

2.1. Preceding preparation: Preparing anything beforehand indeed comes to be a great help at times. Therefore, in case of interview too, you ought to prepare on prior basis. Do more and more practice stand before the mirror. Mirror will intensify your confidence as you

ANALYSIS OF THREE JAW TYPE FLEXIBLE CLUTCH**Nitin S. Sawarkar¹, K. S.Zakiuddin², Dr. Obaid Noman³, Dr.Prachi Palsodkar⁴**¹Department of Mechanical Engineering, Priyadarshini College of Engineering, Nagpur, Maharashtra, 440019.²Professor&Head,Department of Mechanical Engineering, Priyadarshini College of Engineering, Nagpur, Maharashtra,440019.³Asst. Professor, Dept. of Pathology, Jawaharlal Nehru Medical College, Datta Meghe Institute of Medical Sciences, Wardha.⁴Asst Prof. Department Of Electronics Engineering, Yeshwantrao Chavan College of Engineering (YCCE), Nagpur.**ABSTRACT**

This paper presents the stresses and deformations of the assembly of the three Jaw type Flexible Clutch depending on the applied materials. Structural analysis of the three Jaw type Flexible Clutch was performed by using the finite element method. First, the input data for the numerical analysis was calculated. Numerical analysis was performed in the ANSYS software package. As a result, the values of stresses and deformations that occur on the clutch are obtained.

The modeling involuntary in PTC Cre-O, initially rendered the three-dimensional model, and it is exported to the ANSYS analysis software for further simulation. These results are ready to lend a hand for selection of the suitable clutch material for various applications in industrial machines. This can be also useful for the comparative study of Jaw type flexible clutches (JTFC). For performing and evaluating experimentation of such models, need a shore up from Artificial Neural Network (ANN), Artificial Intelligence (AI), and Mathematical modelingdevelopment. This will be effective to make predictions about behavior.

Keywords: *Jaw Type Flexible Clutches, Artificial Neural Network, Artificial Intelligence.*

1. INTRODUCTION

Industrial machines with low powered torque are mainly use clutch. Flexible clutch is used to unite the automatic or non-automatic source of motion or power. Without the output movement, the clutch can permit a motor to run when it is disengaged [1]. At the start of motor-powered heavy machine, the drive to the machine should be disengaged until the motor attains the full or safe speed.

This research will mainly focus on the three Jaw Clutch. This type of clutch advantage is to be positive engagement and once coupled, can transmit extremely good torque without a-slip therefore, also known as Mechanical Positive Contact Clutch [2]. Three Jaw Clutch was conceptualized to permit angular retardation of the Input shaft and angular acceleration of the load shaft. When a spinning machine begins, it has to accelerate to the desired velocity from rest. It gives two shafts that have different rotating speeds an even and steady connection [3,4]. This research will be helpful for the industry as this data-based model can be useful for the selection of the most exceptional clutch-type for various applications in low powered processing Machines. The Clutch can use on Hand Looms, Warping, Spinning, and Low Torque Transmission Machines [5]. In that clutch,

Artificial Neural Network (ANN) Model for prediction of Human Energy Consumption of women Thresher machine operators

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Abstract: The objective of the present research paper is to develop Artificial Neural Network Simulation and analysis for prediction of Human Energy Consumption (HE) of women Thresher machine operators as dependent π term and considering Anthropometric, Physiological, Environmental, Crop and machine variables as independent π Terms. The output of this network can be evaluated by comparing it with field data, mathematical data and the predicted ANN simulation. ANN Simulation model developed for can very well be used in Artificial Neural Network Simulation and analysis for prediction of Human Energy Consumption (HE) of women Thresher machine operators.

Keywords: ANN model; dependent π Term, independent π Terms, Human Energy Consumption (HE)

1. INTRODUCTION

To arrive at mathematical model, the process started with development of some preliminary mathematical relations and then arriving at some single generalized equations. The mathematical model to calculate for Human Energy Consumption (HE) of women operators for thresher machine considering Anthropometric, Physiological, Environmental, Crop and machine variables is developed by Kadam .A.D [1]in 2019.Kadam .A.D et.al [2,3] studied for improving the existing condition of thresher machine women operators by field data base modeling and analyzed the effect of various input variables on the response. The final objective of this study is not only developing the models but also to find out the best set of variables. The best set of variables will outcome in maximization and/or minimization of the response variables [4-9]. Human Energy Consumption, HE needs to be minimized is the objective functions corresponding to developed models. The models have been formulated mathematically as well as by using the ANN. Now we have sets of values of independent π

Developing a mixed solar drier for improved postharvest handling of food grains

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Abstract: Drying of grain is usually achieved by spreading grains on earth for solar radiation. This technique is moderate, but being unsecured from a downpour, dust, invasion of bugs, rodents, and distinct animals, items might be severely degraded to the degree that occasionally becomes contaminated and issued loss of nourishment excellence. To defeat this, solar drying is the greatest assuring technique for the protection of agricultural commodities. In the proposed research, the low-cost mixed-mode solar dryer was developed (Workshop of Dr. D. Y. Patil Institute of Technology, Pimpri, Pune, Maharashtra, India) using locally accessible, environmentally friendly materials, and the performance was evaluated. The solar dryer was developed using the components like a solar collector (reflector), adjusting slot, connector, air heater chamber, stand, drying chamber, helical screw assembly, handle, hopper, and hose pipe. The drier had a 10 kg loading capacity for wheat grains. The average temperature rise observed in the drying chamber was about 27.7°C above the ambient temperature at around 3 pm afternoon which is significantly higher than the ambient temperature. The dryer exhibited sufficient ability to dry food items relatively rapid to a safe moisture level, and together, it assures the excellent quality of the dried commodity.

Keywords: solar drying, mixed-mode, grains, performance evaluation, experimentation, postharvest drying.

Citation: Dhande, H. K., S. D. Shelare, P. B. Khope. 2020. Developing a mixed solar drier for improved postharvest handling of food grains. *Agricultural Engineering International: CIGR Journal*, 22(4): 166-173.

1 Introduction

Due to the short-lived nature of products of the soil are probably going to suffer a lot from substantial postharvest losses in the event that they are not used quickly following to its development. A portion of the purposes behind the higher loss are weak harvesting innovations, absence or immature handling and preparing techniques, and crash of the market to expend the majority of an inventory in

harvesting season (Simate and Cherotich, 2017). Drying is performed either utilizing petroleum products in an affected mechanically process of drying process or by putting yield in open sun. Drying and storage of fruits and grains are the stages where improvement needs to achieve (Salvatierra-Rojas et al., 2017). The compelling techniques in lessening postharvest losses of various grains and fruits are drying. Drying procedures assume a significant role in the protection of horticultural items (Jawalekar and Shelare, 2020). They are described as a method to evacuate the moisture due to synchronous mass and heat exchange. It is likewise an old technique for food preservation, which gives a longer time of usability, lighter load to transport and littler storage space (Ajala et al., 2019). Throughout the

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Developing a mixed solar drier for improved postharvest handling of food grains

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A REVIEW ON DESIGN OF COMPONENTS OF 4 STROKE ENGINE USING HYBRID METAL MATRIX

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ABSTRACT

In the present study of Aluminium Metal Matrix Composite (AMC), specifically speaking, in our case Al-SiC-graphite have been discussed in the design of the engine components. The characteristics of base aluminum alloy but not completely identical. Actually, metal matrix composites have different properties when compared with Cast Iron and Aluminum. This difference in properties gives us various design elements which may give better results than the conventional ones. The main approach of the present study is to design the matrix for 4 Stroke Petrol Engine namely piston & connecting rod. Matrix composites have better strength, stiffness, Modulus & Low Thermal Conductivity as compared to the base materials.

KEYWORDS: Metal Matrix, Al-SiC-Graphite, Engine, Matrix, Features

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INTRODUCTION

What we have learned from our past is that due to our need the solid materials are being replaced by composite materials so as to fulfill our need for obtaining a light weight, elite, nature friendly and corrosion resistance materials [2]. The production and regular improvisation of a variety of Aluminium based composition and use of hybrid metal matrix has been an area of influence in the field of material sciences and engineering for as long as three decades [3-5]. This has been only possible because composites made out of Aluminum shows versatility which has been a success in the field of development of better performing components than the conventional ones for defence, marine, automobile, aerospace and far more industrial based application processes including facilities for sports and recreation [6-7]. Metal composite materials have discovered application in numerous zones of day by day life for a long while. Regularly it isn't understood that the application utilizes composite materials. Delivering of such materials is done from regular generation and handling of metals. Combination of metal, ceramic and non metal provides limitless variation [8]. AMC's i.e. Aluminium based metal matrix composite has so many attractive properties that it has gained enormous importance in the field of aerospace and automotive industries. The need for obtaining a material with such optimal density, abrasive resistant properties and specific stiffness has been fulfilled by the use of these AMC's. Many reports that has been published associates themselves with the development of microstructure and distribution of particles in the matrix alongwith mentioning their mechanical behaviour. At present there are three methods to produce these reinforced composites namely spray deposition techniques, powder metallurgy, and stir casting [9-11]. The basis behind this methodology is to obtain a Hybrid Composites made up of specific metal matrices which are engineered by amalgamating different substances so that we get a final product consisting of mixture of advantages of those primary materials. By combining in such a method provides one with a

A REVIEW ON DESIGN OF COMPONENTS OF 4 STROKE ENGINE USING HYBRID METAL MATRIX

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ABSTRACT

In the present study of Aluminum Metal Matrix Composites (AMMCs), specifically speaking, in our case Al-SiC-graphite have been discussed on the basis of literature review, comprising of similar characteristics of base aluminum alloy but not completely identical. Aluminum metal matrix composites have different properties when compared with Cast Iron and Aluminum. This difference in properties gives us a chance to design components which may give better results than the conventional ones. In a new approach, we are trying to develop new components for 4 Stroke Petrol Engine namely piston & connecting rod, which would have better Tensile Strength, Young's Modulus & Low Thermal Conductivity as compared to the pure Aluminum.

KEYWORDS: Metal Matrix, Al-SiC-Graphite Specimen, Melting Metallurgy

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INTRODUCTION

What we have learned from our past is that due to our need the solid materials are being replaced by composite materials so as to fulfill our need for obtaining a light weight, elite, nature friendly and corrosion resistance materials [2]. The production and regular improvisation of a variety of Aluminium based composition and use of hybrid metal matrix has been an area of influence in the field of material sciences and engineering for as long as three decades [3-5]. This has been only possible because composites made out of Aluminum shows versatility which has been a success in the field of development of better performing components than the conventional ones for defence, marine, automobile, aerospace and far more industrial based application processes including facilities for sports and recreation [6-7]. Metal composite materials have discovered application in numerous zones of day by day life for a long while. Regularly it isn't understood that the application utilizes composite materials. Delivering of such materials is done from regular generation and handling of metals. Combination of metal, ceramic and non metal provides limitless variation [8]. AMC's i.e. Aluminium based metal matrix composite has so many attractive properties that it has gained enormous importance in the field of aerospace and automotive industries. The need for obtaining a material with such optimal density, abrasive resistant properties and specific stiffness has been fulfilled by the use of these AMC's. Many reports that has been published associates themselves with the development of microstructure and distribution of particles in the matrix alongwith mentioning their mechanical behaviour. At present there are three methods to produce these reinforced composites namely spray deposition techniques, powder metallurgy, and stir casting [9-11]. The basis behind this methodology is to obtain a Hybrid Composites made up of specific metal matrices which are engineered by amalgamating different substances so that we get a final product consisting of mixture of advantages of those primary materials. By combining in such a method provides one with a



Improvement in Performance of Series Z-Source Inverter with an Application as Solar PV Fed Water Pump

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Abstract

For a stand-alone solar pump, Z-source inverter (ZSI) is being preferred because of its single-stage power conversion capability with buck-boost ability. As compared to traditional ZSI, series Z-source inverter (SZSI) reduces the voltage stress on capacitor and inrush current of the inductor significantly. In this paper, modes of operation of the SZSI for an induction motor load are explained. When an induction motor runs at a low power factor, an additional mode exists. In this mode, high-magnitude pulses appear on the DC link voltage if the decoupling capacitor is not used with an unidirectional source like solar photovoltaic (PV). In addition, an improved modulation technique is proposed to improve the performance of SZSI. This paper presents a performance of SZSI with solar photovoltaic as a source and an induction motor coupled with the centrifugal pump as a load. Simulation results show the performance of the proposed scheme. Experimental and simulation results demonstrate the validity of analysis. Therefore, SZSI is a promising topology for the solar PV stand-alone system.

Keywords Z-source inverter · Series Z source inverter · Sinusoidal pulse width modulation · Shoot through · Induction motor · Solar photovoltaic · Water pumping

List of Symbols

| | |
|--------------------------------|--------------------------------------|
| I_{s0} | Source current, A |
| I_{L0} | Inductor current, A |
| I_{C0} | Capacitor current, A |
| I_{DC0} | DC link current, A |
| V_{DC0} | DC link voltage, V |
| $\Delta t = t - t_0$ | Change in time period, s |
| V_{LC} | DC voltage in LC circuit, V |
| $\omega = \frac{1}{\sqrt{LC}}$ | Resonant frequency of LC circuit |
| T_c | Period of carrier frequency, seconds |
| I_{Lmax} | Maximum value of inductor current, A |
| M | Modulation index |
| D | Shoot through ratio |
| V_C | Capacitor voltage, V |
| V_{PV} | Solar PV voltage, V |
| V_L | Inductor voltage, V |

| | |
|-------|---|
| V_p | Decoupling capacitor voltage, V |
| f_s | Switching frequency, Hz |
| r_L | Equivalent resistance of inductor, Ω |

1 Introduction

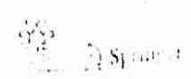
Presently, due to the increasing use of conventional energy sources and its environmental impact has tilted an interest in choosing renewable energy sources such as solar photovoltaic and wind energy. Electricity demand is increasing day by day; therefore, renewable energy source has become popular like solar energy. The use of solar power is also economical particularly in the remote area where grids are not available or load shading occurs frequently. Even though ample water sources are available in the field, farmers and people are unable to deploy water due to the shortage or unavailability of the grid supply. Solar PV based water pumping offers an eco-friendly solution to this problem.

In a solar PV-based pumping system, DC motors and BLDC motors are widely used. The induction motor is also attracting the attention of researchers because of its high

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A Review on Visual Secret Sharing Schemes for Binary, Gray & Color Image

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ABSTRACT

Today's fast growing world of the internet is acquiring more attention of people. People are using more services provided by e-commerce and social sites, they exchange multimedia data over the internet thus there is need of data confidentiality, integrity and availability. Cryptography is used to solve some of above problems. Visual Secret Sharing (VSS) schemes capable to handle the problem related with sharing of visual data. But display quality, variations in share sizes, insecurity in transmission of shares, originality of share, pixel expansion, etc. are still open problems. The aim of this paper is to review and examine numerous existing visual secret sharing schemes, which tries to solve above problems. This information will be useful to researchers who would like to work in this area.

KEY WORDS: VISUAL SECRET SHARING SCHEME (VSSS), VISUAL CRYPTOGRAPHY (VC), VSSS PERFORMANCE MEASURES

INTRODUCTION

Today many people are using the internet to transfer their multimedia data. This data transfer on an open network environment is not safe because an intruder tries to check, alter or access your confidential data so there is an urgent need to provide security to this data. Security will be provided in terms of confidentiality, integrity and an availability of data. Confidentiality limits access to data and which is managed by encryption of data. Integrity is related to reliability of data and which is managed by hashing algorithm and availability is assurance of getting unbreakable service from a reliable source. In order to tackle the problem of data encryption

and hiding, cryptography and steganography techniques are used respectively.

Visual Secret Sharing Scheme (VSSS) is the cryptography technique for visual sharing of secret images. Naor M. et al.(1994) invented this cryptography technique in year 1994. They proposed and demonstrate k out on n VSSS. In this scheme 'n' shadows / shares are generated by a dealer on transparencies. When 'k' shadows out of 'n' shadows are stack together then only secret data will be visible otherwise not. Following figure 1 shows an example of 2 out of 2 visual cryptography scheme (VCS) by putting four sub-pixel in the shadow image for each pixel in a secret binary image. Secret will be reconstructed using Boolean OR operation. It will increase the size of output image.

Visual data may be monochrome image, gray image or color image. Many researchers work on different visual data to solve various existing problems such as a quality of reconstructed image, variations in share sizes, insecurity in transmission of shares, originality of share, etc. In this paper, we study and analysis various VSS schemes based on some performance parameters.

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AN INTELLIGENT CONTROLLED WATER SUPPLY SYSTEM FOR APARTMENT AND SOCIETY

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ABSTRACT -----Water is the most precious and valuable resource. With the increase in population, availability of clean water has become a problem. Today, water-supply department as well as common man is facing problems in real-time operations like water distribution and conservation efficiency. Therefore it is important to find a solution to address water wastage through efficient water monitoring and control system. In this paper, the problem is solved through autonomous water tank filling system using IoT where in embedded sensors are used to monitor the tank status along with some other key attributes like power supply, incoming water supply in real-time. Our intention of this research work was to establish a flexible, economical, easy configurable and most importantly, a portable system which can solve our water wastage problem along with saving the electrical energy. This enhances the efficiency of water distribution and reduces wastage.

Keywords—Water conservation, Real-time monitoring, Proper utilization of Water, IoT, Sensors, Cloud.

I. INTRODUCTION

Managing water in urban areas is an ever increasingly complex challenge. Technology enables sustainable urban water management and with integrated smart metering solutions, massive amounts of water consumption data from the end users can be collected. However, the possibility of generating data from the end user holds no value in itself. It is with the use of data analysis the vast amount of the collected data can provide more insightful information creating potential benefits. It is recognized that a deeper understanding of the end user could potentially provide benefits for operational managers as well as for the end users. A single case study of a data set containing high frequency end user water consumption data from rental apartments has been conducted, where the data set was analyzed in order to see what possible information that could be extracted and interpreted based on an exploratory data analysis (EDA). Furthermore, an interview with the operational manager of the buildings under study as well as a literature review have been carried out in order to understand how the gathered data is used today and to which contexts it could be extrapolated to provide potential benefits at a building level. Smart water meter is a device that measures the amount of water consumed by householders who have the device fitted within their premises. Water conservation is a big issue in many apartments. A common meter is fitted and cumulative

consumption amount is shared among households where they are being charged more than what is to be paid. There are several ideas to overcome this issue. In this paper we have proposed a solution to this issue in which a device used to calculate the flow rate and quantity of water consumed by the householders and send it to the cloud to monitor the consumption of water.

II. RELATED WORK

This work focuses on a solution for 'Water management' in urban areas with the help of IoT. Water is precious and the supply needs to be regulated. Water demand is exponentially growing high with the increase in population of the urban areas. To maintain the supply demand ration proper, it is important to have systems to prevent any water loss & hence we have designed an IoT system with which we can plan usage of water according to the availability.

III. PROBLEM STATEMENT

Some of the automated water level monitoring systems are already present, but most of the methods have so far some shortcomings in practice. I tried to overcome these problems and implemented an intelligent controlled water supply system for apartment and society. I'm focusing mainly on the following problems of existing system.



Fourth Generation Digital Restaurant with high speed Service

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Abstract - In the most recent year the eatery business has survived numerous progression. Anyway, thereis a zone that should have improved since a very long while. While technology is changing the way we do almost everything, menu cards are still mostly untouched - although they have several disadvantages that can be improved significantly by a digital approach. The Digital Restaurants project aims to improve this situation. Buyers today are adjusted to cooperate with computer frameworks in many numerous part of their day today life. Now and then we even lean toward them to customary strategies, particularly when they help to offer quick and advantageous support.

1. Introduction

Some of the time we even favour them to conventional strategies, particularly when they help to offer quick and advantageous support.

The advancement of innovation is expanding quickly. This is proven by numerous things can dieneching innovation such a cell phone. The cell phones, for example, PDAs, tablets, and PDAs, can be incorporated with different gadgets like PC or LCD screen, may use to set up an organization of data and correspondence innovation. The means of menu request, in the eatery, for the most part will increase a few issues, for models: bring time on the grounds that the food request is composed utilize a pen and paper, there is a likelihood that it traded with the others shoppers have, and no data about the load of food whether accessible or not, that causing the server re-visitatation of buyers and ask it again the same situation. This exploration expects to disclose how to actualize an application that can be utilized to make the food requesting the café carefully. The technique begins when the shoppers are served by utilizing a computerized menu board. At that point, the shopper's organization is embedded through that

gadget. After the requesting completed, it sent straightforwardly to the kitchen through Bluetooth which associated with a kitchen's LCD. So as to make simple kitchen, it is done through LCD screen, so the chance of off base the request will limit. After it is finished, kitcheners will post a status for the quantity of table's requesting that prepared to serve to the framework. At last, the robot will get the requesting and bring it as indicated by the rundown of the quantity of the request that is in the framework.

2. Literature Review

The eatery is a most loved spot to spend time with loved ones. Be that as it may, in the Cafés some of the time have a significant issue such set aside a long effort to serve the food request on the grounds that getting a ton of requests. It very well may be befuddling culinary specialists in arranging when requests must be handled first. Deferrals in serving food which has mentioned by the shoppers can frustrate and not fulfilled them. That thing can make a terrible picture of the eateries so they' bid is diminished. This hindrance can be limited by setting up a framework which paces up its cycle utilizing a

2



Fruits Counting and Packing System using Conveyor Belt Mechanism

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Abstract: Most of the industries have advancement in technologies and automation. Due to automation human efforts are goes on decreasing since last decade. The industrial environments are adopting more and more aspects of automation to enhance product quality, accuracy and to reduce product cost. Conveyor system are wildly using in manufacturing industries. The automatic conveyor system is work by mounting the material. The project is gives us an idea about automatic counting and collecting material. Here we are designing and implementing an efficient material counting system using Arduino UNO, Photo Diode and IR Sensor. This project gives high accuracy and performance. It is easy to operate and construct which reduces human error.

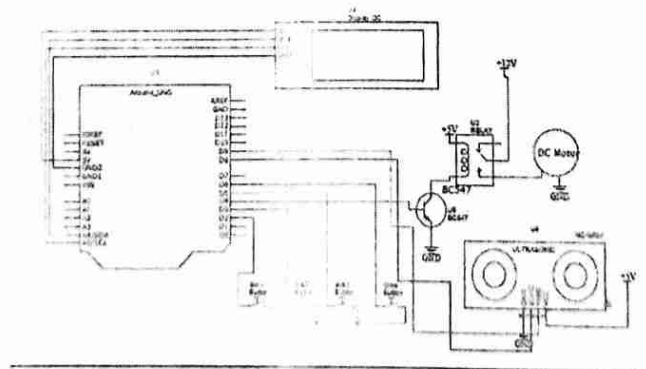
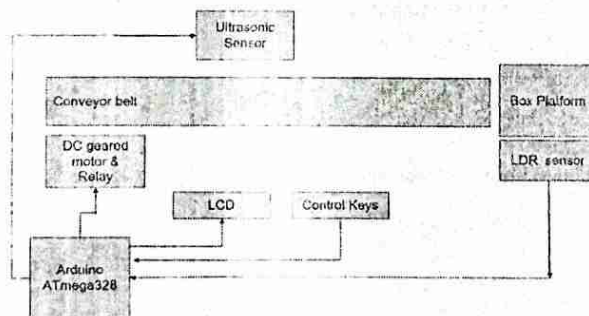
Keywords: Conveyor Belt Mechanism, Arduino ATmega328, DC Geared motor, LDR Sensor, Ultrasonic Sensor, LCD

I. INTRODUCTION

Everywhere in industrial sector automation enhancing drastically. Manually material counting and remembering it to for too long time is some how difficult for human brain and also manually counting and separating the material is required more money, time and machine. To reduce these wastage, many companies started to adopt automation in the plant. If the industries use automation, it helps to increase rate of production, with smart utilization of space at reasonable rates. This automatic material removing conveyor system separate the material depending on their counts. It contain Arduino, Conveyor Belt, IR sensor, Photo diode, Servo motor, LCD display. Most of the industry have a conveyor system to move the material. The LED display will help to understand the status of material Count.

II. BLOCK DIAGRAM AND CIRCUIT DIAGRAM

A. As shown in the diagram, Arduino board the main microcontroller ATmega328 is use.



Implementation of Automatic Parcel Sorting System Using RFID

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ABSTRACT

Improvement in the modern area is an everlasting and needful procedure that prompts better use of assets and financially profitable condition to create. Such Development can be found in the day by day exercises of enterprises that utilization different procedures to work. Development in the modern domain is generally identified with the development of the country itself, with many significant quickly developing economies and India being one of them there is a tremendous organic market chain of activity inside the nation. The modern zone joins the assembling quarter and dissemination zone. Different procedures are associated with such bodies to work, one such procedure is transport and sorting of items that should be passed on starting with one purpose of disembarkation then onto the next. With the gigantic necessity of products to be made and dispersed manual sorting has gotten obligated for the inadequate utilization of assets at the expense of time and trade. This paper proposes the utilization of RFID label read innovation with transport line component, to sift through and track distributes continuous in various phases of assembling units in businesses. Utilizing the radio recurrence recognizable proof procedure as the fundamental working rule the venture utilizes RFID as its primary sensor which separates between various packages relying on pin code. The RFID labels joined to objects assist with recognizing various bundles in various areas of the conveyance procedure. This package sorting machine can be utilized in post workplaces, conveyance administrations, fabricating units, and so forth.

Keywords : Radio frequency identification, RFID tags, automatic sorting, Servo motor Sorting mechanism, Conveyor Belt

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I. INTRODUCTION

RFID is an automatic innovation and helps machines or PCs to recognize objects, record metadata or

control singular objective through radio waves. Associating RFID peruser to the terminal of the Internet, the perusers can recognize, track and screen

RFID Based Kid Security System with SMS & Real Time Location

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Guided by:-Dr. Y.A. Nafde

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Abstract—Now-a-days with the increase in the crime rate and accidents parents have to worry about their children when they are going to schools. To get rid of this fear they need some systems to know the status of their children, this system is proposed to focus on safety of children travelling through school buses. The system describes which gives real time notifications about the location of a child using GPS. RFID. It has two units BUS UNIT and SCHOOL UNIT. BUS UNIT consists of RFID Reader, different sensors and GSM module to issue the alert messages to parents when their children boards or leaves the bus. Temperature sensor, gas sensor, accelerated tilt sensor will be placed within the bus unit to detect fire, gases and tilting of the bus and issues alert messages by giving the location of the bus using GSM and GPS modules. SCHOOL UNIT consists of RFID Reader and GSM Module. The entire data in two units will be processed by using ARDUINO UNO ATMEGA 328 Processor.

INTRODUCTION

At present days all are very much aware about the safety concerns. At the same time parents can admit their children in schools which have high reputation and all facilities. Now-a-days all schools have bus facilities, even though their children are going to school through school bus parents have some worry about their

child, are they reached safely or in a dangerous situation (e.g. when the bus met with accidents

then they need help). This project gives a solution for this question. This system also issues alert messages when a child boards and leaves the bus using the RFID tag which was worn by the child by placing that tag before the RFID reader . These sensors and RFID reader are interfaced with the ARDUINO UNO board which has an ATMEGA328 processor. The outputs of this ARDUINO UNO board are given to the GSM module and LCD display. This GSM modem can send the messages to authorized persons according to the received data . LCD displays the message about the accidents [4]. This total system will be presented in a bus, which is called BUS UNIT. Here a SCHOOL UNIT is also there which has an ARDUINO board, RFID Reader and GSM Modem. This unit will issue the messages to parents to con-vey them that their children have reached the school safely, and they are in the school premises.

Literature Review

Our project idea is to put an end to incidents like Innocent children are ending their lives for unworthy reasons . There are many systems which provide security to the school children. The use of RFIDs makes it easier to maintain and usage, but could not give the certain formation about the situation in the bus i.e....this system does not provide any information when children are in dangerous situations

To track the live location of the bus for the speedy recovery when it is subjected to

Medicine Scheduler using Node MCU

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Abstract: The idea of a digital world where different types of sensors and local processing connected to share information is used in many industries nowadays. There are various products which are developed based on these ideas. Healthcare industry is one where a lot of improvements are taking place. Medicines play an important role for prevention and cure for most of the diseases. Many Harmful and risky diseases can be cured through proper medication. The proposed system consists of an IoT enabled medication reminder system and it gives timely alerts for the patients about their medication time. It alerts the patient to take medicines at the proper time by providing audio-visual alert. The system helps to monitor whether a patient has taken the medicine and it's healthcare data.

KEYWORDS: Automatic Alarm, Reminder System, Notification System, Medication Adherence, Medicine

1- INTRODUCTION

The idea of a digital world where different types of sensors and local processing connected to shared information is used in many industries nowadays. There are various products which are developed based on these ideas Healthcare industry is one where a lot of improvements are taking place.

Medicines play an important role for prevention and cure for most of the diseases. Many Harmful and risky diseases can be cured through proper medication. The proposed system consists of a medication reminder system and it gives timely alerts for the patients about their medication time. It alerts the patient to take medicines at the proper time by providing a buzzer alert. The system helps to monitor whether a patient has taken the medicine and it's healthcare data.

In today's life, everyone has to take medicines due to several health issues. In olden days this problem was less compared to now. Well, everyone does forget to take their medicines on time at some point in their life and it is very important to take all the medicines properly and on time. Similarly, taking medicine at wrong intervals may lead to some severe side effects. Some diseases are temporary so the person need not take medicine every day but there are many everlasting life threatening diseases. These life-threatening diseases are very dangerous to the health, so that kind of people have to take their medicine daily without fail. Blind people and adults cannot always remember to take the medicine regularly which creates several problems and health issues. We need to have the counsel of Doctor who tells us to take desired pills in a desired way so that patients face problems like forgetting pills at the right time. Since the target audience of the device is Geriatric, it is user-friendly, handy, safe to use and light in weight. It is a portable device and it is a handheld system. Blind people, uneducated people can also use this system. There is no age limit to use this device

COLD STORAGE MONITORING SYSTEM

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Abstract - In recent years, wireless sensor network (WSN) is increasingly applied in the field of environmental monitoring due to its promising capability. Focused on the monitoring of cold storage, this paper constructed a wireless sensor network based on Cloud Storage protocol. The design scheme of sensor node and sink node were described in detail. Cloud Storage technology was considered as the core of information processing and wireless nodes detection. Through sink node as well as integrating wireless mobile network (CDMA), acquired data was sent to database server on control center. Experiment results show that the working performance of the system is quite stable and can reach the design requirements in real-time data acquisition and remote control. Furthermore, the system has the characteristics of good expansibility, networking flexibility and low cost. The design gives a new way to collect the data of environment instead of the traditional way using wires or manually. This work describes a monitoring system for cold storages that includes: temperature, relative humidity, electric power and the state of the access door. It is compliant with ISO 12830 Class 1: capable of measuring temperature from -20 to 60°C and humidity up to 100%RH. This system is a complete monitoring, logging and alarm generation solution whose capability was tested in real life applications.

Keywords: Cold storage, Internet of Things,

I. INTRODUCTION

We are familiar with the word Cold storage; it is used to preserve something for a longer period of time, just like Refrigerators. Cold Storage is usually use to keep things like food products, agricultural products, Pharmacies, etc. It has been the most effective and the best way to transport products from one place to another until lately when the news has been spreading of products getting spoiled on the way because when it is on its way to somewhere no one knows of the temperature inside the cold storage or even in some cases, no one knows if the product inside it requires a lesser temperature or anything like that.

Basically, when the product is on its way to somewhere we cannot handle it, and it has been a major concern now. We

had the opportunity to talk to Shree Vinayaka foods Karanja MIDC for the problem facing to monitor the cold storage online and to give the alert message on mobile for some errors like high temp and power failure

So we decided to work on it. A cold storage system based on IOT, where one can accesses the temperature of the Cold storage from anywhere, anytime. Also, our product will give an alert message if anything goes wrong The modern-day scenario of the global cold chain pharmaceutical industry has called upon the cold chain logistics as the need of the hour. The cold storage requiring industry is being crippled with challenges like increased product volume and sensitivity, ever growing regulations and controlled environment monitoring.

We aim to reduce the extent of human presence all along the cold storage by means of a powerful tool in the form of the Internet of Things (IOT).

II. LITERATURE REVIEW

An IOT-based cargo monitoring system for enhancing operational effectiveness under a cold chain environment

Differing from managing a general supply chain, handling environmentally sensitive products (ESPs) requires the use of specific refrigeration systems to control the designated range of storage conditions, such as temperature, humidity, and lighting level in a cold chain environment. In general, third party logistics (3PL) companies are authorized to handle ESPs, who therefore need to have a good cargo monitoring system in the cold chain environment, without which the functional quality is difficult to control and manage. This may result in product deterioration and even inventory obsolescence of the ESPs due to the lack of such systems, so there is a need to develop an effective cargo monitoring system to prevent such situations.

This article proposes an Internet of Things-based cargo monitoring system (IOT-CMS) to monitor any environmental changes of ESPs in order to ensure their functional quality throughout the entire cold chain operational environment. Operational efficiency, maintenance strategy, environmental change, and electricity consumption are considered in real-life cold chain operations. Through applying (i) a wireless sensor network to collect real-time product information, together with (ii) fuzzy logic and case-based reasoning techniques to suggest appropriate storage conditions for various ESPs, effective storage guidance can be established. Through

RF SYSTEM TO DETECT THE LOCATION OF MINERS IN COAL MINES

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Abstract— The main aim of the paper is to develop a smart helmet for mining industry workers. The problem addressed in this paper is the improvement of a mining helmet in order to ensure more safety awareness between miners. When working with noisy equipment, being aware of one's surroundings can sometimes be challenging. In the mining trade miners tend to get rid of their safety gear because the gear is too significant, heat or uncomfortable to work with. So, this system is developed to intimate the authorities in critical conditions. To overcome the above problem, we are developing a smart helmet for mining industry workers. Firstly to identify the worker, each worker will be having different tag. Once the tag is identified, person's data will be sent to the PC, in order to check whether the worker has been using the helmet or not. The surrounding hazardous gases will be detected by the gas sensor present in the helmet. Temperature and humidity sensor check the data and sent to the base station, LDR sensor is used to control LED turn on and off. All the data related to sensors will be sent to the PC using wifi.

Keywords--Industry workers, gas sensor, temperature and humidity sensor, IoT based system.

I. INTRODUCTION

India is a country, which is renowned for its extensive and distinct mineral reserves and big mining businesses. As of 2014 April, India has over three hundred Billion Tonnes coal holds. Generation of coal in the year 2012 and 2014 remained at five hundred and forty Million Tonnes and five hundred and fifty seven Million Tonnes respectively. Coal mining is a relatively dangerous

Industry. Employees in coal mining may be killed or may face major injuries and compared to the workers in private industry, coal miner injuries will be severe. Supervisors will be held accountable for all the wounds that take place below their management, and thus they need to consider the probable unsafe circumstances. The issue that we are addressing in this work is to develop a prototype of a safety helmet so as to assure extra safety alertness among mine workers. At the point while they are on job with machinery which produces loud noise, being alert to one's surroundings will typically be difficult. The present mining helmets are so simple that can protect miner only from physical damages to head. It doesn't have special features to let workers know when he or his associate worker has experienced a dangerous event. Thus, the motivation of the project is to add extra safety measures in a current protective helmet for mine workers to make it more safer and technologically advanced by including a sensors, micro controllers and wireless communicating capabilities. In this project, we give an overview of the Mine worker Location Detection System with Gas, Temperature Sensing and Alert System. The main aim of our project is to rescue the mine workers who get stuck in the tunnel while working due to some accidents. It can be used in any coalfields like, Western Coalfields. The worker are having the helmet and all the sensors are attached on the helmet. The RF signal use to identify the tunnel of the worker. The signal send to the outer control room via Wi-Fi. For this the repeaters are connected in the tunnel to increase the range of Wi-Fi.

GSM BASED AUTOMATED GARBAGE TELLER MACHINE FOR METAL AND PAPER RECYCLE

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Abstract

Modern world meets lots of challenges that includes Smart waste management system. It is become matter of big concern if proper disposal system is not managed. Managing waste effectively and recycling efficiently, a nation can ahead one step forward. By using the proper recycling system, the curse of waste will turn into blessings for the civilization. The conventional waste management system will be transformed into SMART system. Big volumes of garbage thrown away and the methods used to store it cause air, water, and soil pollution. Fortunately, people can count on other methods to reduce the quantity of produced litter. An answer is recycling by re-using the materials. Currently, the traditional way to separate waste is to use different containers for each kind of waste separating trash manually, which does not always work.

Introduction

In e-waste, collectors (collecting e-waste from all kinds of resources) and processors (disassembling and disposing e-waste) play key roles and have connections based on interests. This project present a leader (collector)-follower (processor) dynamic game model with profit maximization purpose. When the supply and demand are relatively clear, major risk for the processor comes from the recycled raw material is sold to producer is not enough to compensate for buying, processing and possible land filling e-waste, the processor is unable to make profit. So this project propose an option contract in which the collector will buy raw material from the

processor at a fixed price in the future. This option will guarantee the processor Profitable and increase the effort to order more e-waste from the collector. This show that this contract is improving in the majority of cases. Our results also indicate that the profit improvement to both parties, and the supply chain is substantial.

Objectives

- This project aims to improve the systems for the collection of recyclable waste metals.
- This project is intended to improve the efficiency of these system as well as make them closer to people by promoting recycling metal materials.
- Save your precious money.
- If done efficiently, it leads invariably to the better management of materials and inventory.



IoT Node Performance Monitoring for Wireless Sensor Network

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ABSTRACT -----The Internet of Things is an emerging technology across the world, which helps to connect sensors, vehicles, hospitals, industries and consumers through internet Connectivity. This type of architecture leads to Smart Cities, Smart home, Smart agriculture and Smart World. Architecture of IoT is very complex because of the large number of devices, link layer technology and services that are involved in this system. However, security in IoT is the most important parameter. IOT is a smart technology that connects anything anywhere at any time. Such ubiquitous nature of IoT is responsible for draining out energy from its resources. Therefore, the energy efficiency of IoT resources has emerged as a major research issue. In this paper, an energy-efficient architecture for IoT has been proposed, which consists of three layers, namely, sensing and control, information processing, and presentation. The architectural design allows the system to predict the sleep interval of sensors based upon their remaining battery level, their previous usage history, and quality of information required for a particular application. The predicted value can be used to boost the utilization of cloud resources by provisioning the allocated resources when the corresponding sensory nodes are in sleep mode. This mechanism allows the energy-efficient utilization of all the IoT resources. The experimental results show a significant amount of energy saving in the case of sensor nodes and improved resource utilization of cloud resources.

Keywords—Internet of things (IoT) resources, Sensors, Cloud resources ,security, wireless sensor network

LINTRODUCTION

The power consumption is the main part of the electrical equipment used in home or industry. Our project aim is to monitor individual power consumption by the load or devices which will be online using "IOT". It will help to monitor and analyse the performance of the device and if any load is consuming more power than that device require maintenance. This will help to improve the device life as well as it will save money as energy billing is maintained .We are building the wireless sensor network based current and temperature monitoring node for each load which will send data to the cloud server that we can monitor online.

Internet of things as the name suggests, is the connectivity of everyday devices with each other. With the advancement in technology, numerous devices are using sensors, actuators, embedded computing and cloud computing. This has enabled communication between devices. To put it simply, the Internet of Things enables devices (things) to interact and co-ordinate with each other thereby reducing human intervention in basic everyday tasks. To get a better understanding of IoT consider the scenario of a smart home. As soon as the alarm rings it sends a signal to the coffee maker and the toaster, which automatically start doing their jobs without any human intervention. Thus, saving time and

Cloud Storage System for a Sensor System Parameter with Real-time Data Website with Secure Login

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ABSTRACT

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The enterprises are developing systematically. One of the explanation of the developing ventures is the ascent in the populace so there is a need to deal with the consumption of the energy in light of the fact that there is restricted assets. As of late, investigation into energy sparing has been expanding taking into account managing ecological issues and adequately utilizing energy assets. In a family unit or in mechanical plants, power consumption monitoring of individual inductive gadgets and machines. Would have huge effect on energy investment funds finally. In any case, the present act of estimation of power consumption of the entire meter as opposed to singular gadgets brings about punishments for energy misfortunes because of variety of interest charges in a plant. In this way, electrical power consumption monitoring consistently is basic to shield it from surpassing the basic interest level. Power meters are reasonable energy sparing gadgets that can help screen electricity consumption in a plant. This paper examines the turn of events and execution of a smaller scale controller based versatile computerized power meter that has the capacity to quantify a three-stage power flexibly for a solitary gadget to enhance power utilization in a plant. It could likewise be utilized as an instructive device for undergrad examines.

Keywords : Energy Savings, Electrical Power Consumption, Power Monitoring, Real-Time System

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I. INTRODUCTION

The power consumption is the primary piece of the electrical hardware utilized in-home or industry. The energy bill and the life of hardware rely upon power consumption. If any gadget is devouring more power then there may be some issue with that gadget. That

gadget will go harm because of increased current consumption and warmth creation thus the energy bill goes high. We cannot screen which gadget is devouring more power as there is just one meter accessible for some heaps.

SPECIAL ISSUE ARTICLE

Thermoluminescence dosimetry properties and kinetic analysis of $K_3Ca_2(SO_4)_3F:Dy^{3+}$ phosphorC. M. Mehare^{1,3} | M. D. Mehare² | C. Ghanty³ | N. S. Dhoble⁴ | S. J. Dhoble¹¹Department of Physics, R.T.M. Nagpur University, Nagpur, India²Department of Physics, Priyadarshini College of Engineering, Nagpur, India³Department of Chemistry, O.P.Jindal University, Punjipathra, Raigarh, India⁴Department of Chemistry, Sevadal Mahila Mahavidhyalaya, Nagpur, India

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Abstract

A trivalent Dy^{3+} -activated $K_3Ca_2(SO_4)_3F$ fluoride-based phosphor was synthesized using a solid-state reaction method and characterized for its thermoluminescence (TL) application. The crystal structure and surface morphology of the as-synthesized material was analyzed using X-ray diffraction and scanning electron microscopy. A series of the $K_3Ca_2(SO_4)_3F:Dy^{3+}$ phosphor was irradiated using γ -rays from a ^{60}Co source and TL glow curves were recorded using a Nucleonix 1009I TL reader. The glow curve of the prepared phosphor showed a prominent single peak at 278°C. TL characteristics were maximum intensity at 1 mol% of Dy^{3+} ion with a single TL glow peak. The TL glow curve revealed linearity with increase in exposure dose range from 0.1 kGy to 3.0 kGy. Theoretical analysis of the TL glow curve of the γ -ray-irradiated sample was carried out using a computerized glow curve deconvolution method and trapping parameters such as activation energy and frequency factor were calculated using the initial rise method and Ilich's method. The synthesized Dy^{3+} -doped $K_3Ca_2(SO_4)_3$ phosphor revealed excellent TL properties and was found to be a potential candidate for dosimetric applications.

KEYWORDS

activation energy, dosimetry, frequency factor, kinetic parameter, thermoluminescence

1 | INTRODUCTION

Recently, high performance thermoluminescence (TL) materials have received more attention in technology fields due to an increasing demand for TL dosimeters (TLD), which have wide application in industrial, environmental, personal, and clinical ionization radiation protection.^[1] Thermoluminescence is a phenomenon of crystalline materials that absorbed energy from electromagnetic radiation or other ionizing radiation that is then re-emitted as light upon heating and which can be utilized for radiation dosimetry.^[2,3] The emission intensity of light revealed by phosphors on heating gives an idea of the irradiation dose given to it. A theoretical model for TL analysis was first proposed by Randall and Wilkins.^[4] According to this model, electrons are trapped during excitation in some lattice sites. When crystals are heated, electrons are released thermally into the conduction band and are finally recombined with holes at the recombination

sites, resulting in TL emission, which is represented by the TL glow curve. Thermoluminescence does not refer to thermal excitation, but to stimulation of luminescence in a sample that has been excited in a different way. The TL material cannot emit light again by simply cooling the sample and reheating it another time. It should first be re-exposed to ionizing radiation to again produce light. Generally, TL phosphors useful for dosimetry application must satisfy some important characteristics such as high TL dose sensitivity and accuracy show linearity of dose-response over a wide range. Also they should not exhibit any thermal quenching, be inexpensive, free from hygroscopic and toxicity properties, show negligible UV light response, be reusable, and be easy to process.^[5,6] Dosimetric characteristics of TL phosphor are mainly influenced by their trapping parameters such as activation energy (E), frequency factor (s) and order of kinetics (b), which describe the defect centres responsible for TL emission. Mixed sulphate-based phosphors have excellent TL characteristics due to



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Treatment of complex recalcitrant wastewater using Fenton process

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ABSTRACT

Recalcitrant wastewater from a combined effluent treatment plant of heterogeneous industrial sector is very complex and often possess intense colour and fluctuating characteristics. In this work, the treatment of such complex effluent using photo-catalysis and Fenton processes is investigated. Studies on the treatment of combined wastewater are scarce. The reduction in colour and COD with photo-catalysis was 10% and 5%, respectively; and with Fenton process it was 80% and 72% after 2 h. Fenton process appears to be more promising in comparison to photo-catalysis. Optimization of H₂O₂ & Fe²⁺ concentrations revealed that maximum reduction in colour and COD occurred at ratio of H₂O₂:Fe²⁺ (40:1).

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1. Introduction

An industrial sector in India comprising heterogeneous industries viz., chemical, bulk drugs, dye & dye intermediates & pharmaceutical industries discharges a very complex effluent. The concentrations of COD, BOD and TDS in the final treated effluent are in the range 750–900, 60–100 and 15000–16000 mg/L, respectively. Such effluents on discharge cause water pollution posing threat to environment and human [1–3]. Therefore, the final treated effluent still requires polishing step with respect to colour and COD. Though several techniques for the treatment of segregated effluents from chemical, bulk drug, dyes/dye intermediates have been investigated, such studies on combined wastewater are scarce. The removal of persistent organics [4,5] is often incomplete in Biological treatment and physicochemical methods.

Advanced oxidation processes (AOPs) provide a good alternative to conventional methods [6–8]. Advanced oxidation processes based on the catalytic generation of hydroxyl radicals from hydrogen peroxide are simple and very efficient [9–13]. Photo-catalytic oxidation (PCO) has been used to break down and destroy many types of organic pollutants into simpler components of water and CO₂. In Photo-catalytic processes a semiconductor metal oxide is used as a catalyst [14]. Several catalysts have been used, but TiO₂ in the anatase form have shown high stability, good performance

and is low cost [15]. TiO₂ photo-catalytic process has received more attention because of its low cost when using sunlight as the source of irradiation.

The Fenton process is an Advanced Oxidation Process in which a variety of organic compounds can be oxidised by free hydroxyl radicals having high oxidation potential. The hydroxyl radicals are generated by the catalytic decomposition of hydrogen peroxide in the presence of Fe²⁺. Thus, generation and use of these hydroxyl radicals during the reaction plays a major role in the treatment of waste water using AOPs. Therefore, AOPs are applied for the treatment of complex industrial wastewater [16], power plant wastewater [17], coking wastewater [18], leather industry wastewater [19], acrylic fibre manufacturing wastewater [20,21].

In the present work, the application of Fenton process and photo catalysis for the treatment of complex wastewater from heterogeneous industries viz., chemical, bulk drugs, dye/dye intermediates and pharmaceutical industries is studied. It was observed that with Fenton process, after a period of 2 h with 50 mg/L Fe²⁺ dose, 26.4 mM H₂O₂ and pH 3, there was 80% and 72% reduction in colour and COD, respectively, whereas the reduction in COD and colour were only 10% and 5% with photo-catalytic treatment using 0.2 g TiO₂, initial pH 7.9–8.0, MPML 400 W after a period of 2 h. Thus, Fenton process appears to be more promising in comparison to photo catalysis. In view of this, in this paper, Fenton process for the treatment of combined wastewater is reported. The effects of doses of Fe²⁺ catalyst, H₂O₂, contact time and initial pH on Fenton oxidation of combined effluent were studied.

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