Journals Papers

Speed Sensorless Vector Control of Induction Motor using Extended Kalman Filter

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Abstract— In this paper vector controlled sensorless Induction motor's (I.M.) speed is estimated using Extended Kalman filter. The speed is estimated using measured stator voltages and currents. The performance of Induction Motor is not satisfactory at very low speed due to mismatch of parameters of Induction motor. The reason for variation of parameter is measurement errors, modeling errors, uncertainties. The low speed performance of induction motor is improved by estimating speed of Induction motor using extended Kalman filter under noisy condition. The detailed algorithm for Extended Kalman filter is explained and is simulated by Matlab Simulation.

Keywords— Extended Kalman Filter, Vector Control, Sensorless Induction motor, Estimation.

I. INTRODUCTION

The sensorless Induction motors are extensively used because of improvements in their control technologies and have various advantages such as compactness, low cost, increased reliability and less maintenance. In sensorless vector control, the rotor speed is measured through stator currents and voltages. In unfavourable environments the speed sensors are difficult to use, so sensorless motor is required [1][2]. The various industrial applications of Induction motor drives are electric vehicles, pumps and fans, belt conveyors, lifts, and many more [14]. In past few decades the researches on advance controls like vector control is going on to get the high dynamic performance of Induction motor drives at various speeds . There have been many methods of speed estimation for sensorless I.M. in the literature [5]-[10]. The speed estimation methods are broadly classified as - signal injection based and observer based methods. For medium and high speeds the performance of Induction motor is good, but at low speed its performance is still not satisfactory. Because at low frequency some states of rotor go to unobservable position from the stator side. Similarly the non-linearity of Inverter and parameter uncertainty are also the problems [4] .Therefore at low speed the estimation of speed of Induction motor by machine modelling is difficult [2]. The basis is that at zero frequency of stator the system becomes unobservable and most of the existing speed estimators become unstable at low speeds. These problems can be solved by speed estimation using Kalman Filter. The estimation of rotor flux by closed loop observer not requires the related auxiliary variables and the problem of state integration is also removed. Therefore, the drive have wide range operation and also at zero speed. In some literatures various methods are employed for IM drives speed control[6].out of various methods, Extended Kalman filter is very comfortable inspite of computational complications. Since the model uncertainties (or system noises) and measurement noises are taken into account.[11][12][13]. However the determination of covariance matrices and measurement noises are still difficult. To reduce the modelling error and for fast tracking of mutational state SSTEKF is used [3].

This paper is organized as follows, section 2 presents the field oriented control for Induction motor, and Section 3 introduces extended Kalman Filter for induction motor drives of sensorless speed control. The speed of motor is estimated by the extended Kalman filter. The estimated speed is compared with reference speed of the motor and vector control of motor in very low speed region is discussed.

II. FIELD ORIENTED CONTROL.

The control of the induction motor like DC motor is obtained through field oriented control (FOC) or vector control. In scalar control, there is coupling between torque and fluxes. So, they cannot be independently controlled as both are dependent on frequency and voltage/current. It creates slack reaction of flux and it causes the problem of instability due to 5th order harmonics. This problem of scalar control is solved by vector control [14]. Vector control decouples the torque and fluxes. The

Gain and Bandwidth Enhancement of Array Antenna for S and C Band Application

Kanchan Wagh, S. S. Shriramwar

Abstract: This letter presents a 4x4 hexagonal shaped microstrip antenna array with dual band characteristics at 2.4 GHz and 5.8 GHz. For the enhancement of gain and miniaturization of array antenna, a complimentary SRR (split ring resonator) is etched into ground plane. Corporate feed network is chosen for the equal amplitude distribution at the input of patch elements. The CSRR structure incorporated into the design. This design behaves like a metamaterial which has negative permeability and permittivity which results into negative reflective index. So transmitted wave could not pass into the structure and it gets reflected back from the structure. It also disturbs the current distribution at ground plane. This design work achieves efficiency up to 83%. For the miniaturization of an array, the CSRR etched on the back side of patch element. So that the frequency get shifted. Again for the desired frequency the dimensions of the patch get to reduce. So that the design get miniaturized

Index Terms: Metamaterial , CSRR, Corporate feed

I. INTRODUCTION

Due to the various advantages of microstrip antennas, like light weight, low volume, these antennas are commonly preferred in radar applications, specifically for weather radar and Synthetic Aperture Radar as mentioned in [1]. Research has been carried out in the recent past to improve the performance & efficiency of these patch antennas. Rapid development in patch antennas started in 1970s & by the end of 1980s the idea of using microstrip array antenna in wireless communication was well established. In single element antenna the radiation pattern is usually very broad. So the directivity is effectively very low. By enlarging the size of the element the directivity can get increased. The alternative way is to assemble the antenna elements in a geometrical configuration. The individual which forms the array are usually identical and they can be of any form explained in [10]. Complimentary Split Ring Resonator exhibits band stop characteristics as it is the dual counterpart of split ring resonator at resonant if electromagnetic fields are aligned appropriately [1].To enhance the efficiency and gain, a novel engineered magnetic superstrate is designed in [7]. Defective Ground Structure use for the reduction of harmonics is explained in [8]. The modified split ring resonator unit cell is designed in such a way to get positive values for the effective permeability and permittivity at the center frequency of the antenna. Now a days ground plane is preferred by people for the inclusion of DGS. A miniaturized antenna array is designed with the help of DGS inclusion on the ground plane of antenna. They found the antenna size reduction upto 83% on the DGS properties with respect to miniaturization of antenna. DGS is an etched periodic or non periodic structure in the ground plane which disturbs the current distribution because of the defect in the ground plane. DGS can also be used for the reduction of cross polarization and mutual coupling. It can also be used for the reduction of cross polarization and mutual coupling explained in [9]. The plnar antenna array for Ku band at 13 GHz is presented in [10]. The inclusion of CSRR in the ground plane is very useful technique for antenna miniaturization and the multiband operation of an antenna [10].The DGS structure is also responsible for the suppression of cross polarization without affecting the dominant mode, input impedance and co polarized reduction pattern. Debatosh Guha presented a new concept in [11] for a particular DGS pattern employing a patch having circular shape as the radiator. The CSRR concept of duality has been demonstrated and presented in year 2004 by F. Falcon and the CSRR excited by the axial electric field could reveal negative permeability upon their resonance. In [10], a 4-element dual-polarized aperture-coupled microstrip patch antenna array have been designed for high isolation, wide bandwidth and low cross-polarization levels which will be applicable for a radar system. In array antenna mutual coupling and cross polarization must be reduced. Mutual coupling gives the amount of power coupled between two antenna elements. Formulas are explained in [10]. Array configuration and types of feeding are explain and array antenna for higher frequency with corporate feed is presented in [11].

In this work, the CSRR is etched on the ground plane for the enhancement of gain, efficiency and suppression of surface wave. The dual band 4x4 hexagonal antenna array is presented with and without CSRR and simulation results are also compared. The CSRR composed is of two concentric broken circular rings etched on the ground plane between the patch elements. Some model structure that have been proposed in [6] and also demonstrate how electrostatic energy can strongly concentrated in these structures.

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Image Forgery Detection Based on SURF and Machine Learning Classifier

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Abstract: Today manipulation of digital images has become easy due to availability powerful image editing tools like Adobe Photoshop etc. Detection of a forged image is driven by the need of authenticity and to maintain integrity of the image. The most common type of digital image forgery is known as copy-move forgery wherein a part of image is cut/copied and pasted in another area of the same image. This paper proposed a new image tampering detection method based on Speed-up robust features and Support vector machine (SVM) to detect copy-move forgery in image.

I. Introduction

In Today's time we cannot imagine the exact usage of digital images every day for various purposes. After the survey, Flickr has some 350 million photographs with more than 1 million added daily (record 2007) and Facebook has more than 50 million cumulative upload of images (record 2010) [1].Currently digital images are the most common and convenient way for expressing and transmitting information. Information expressed in thousands of words can be easily and compactly expressed in a simple image. Pictorial information around us represents nearly 75% of all the information received by human being visual system. With the increasing use of digital images and rapid advent in imaging technology, tampering techniques accordingly became more sophisticated. With the help of powerful image editing software, we can easily modify digital images without leaving any perceptible artifacts. Maliciously tampered images would lead to some potentially serious consequences in our daily life which decreases the credibility of digital images, and their content integrity can no longer be fully trusted.

Different techniques for maintaining the integrity of digital images have been developed. In this project we have used the non intrusive technique to find the tampering. In this project we have used the non intrusive technique that exploit different kinds of intrinsic qualities such as sensor noise of the capturing device or image specific detectable changes for detecting forgery to find the tampering.

II. Digital Image Forgery Types

Alteration of the semantic contents of a digital image may be achieved by removing information from that image, or adding extra information to it for which forgers may use many techniques. Different criteria can be used to classify those techniques, but the most important and widely used techniques are image retouching, image splicing, and image cloning.

Digital images retouching is considered to be the less harmful kind of digital image forgery, since it does not make significant changes to the visual message of an image. Instead it can be used to enhance or reduce digital images features consequently; it is widely used by magazine photo editors.

Figure 1 Image retouching technique

IOT Based School Bus Monitoring and Security System

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Abstract:- A vehicle monitoring system is implemented for tracking the movement of a bus from any location at a specific time. The proposed system make use of a technology that combines a smart phone application with a microcontroller. A device is placed inside the vehicle which determines the position of the bus using Global Positioning System (GPS) technology. Users will be able to continuously monitor the moving vehicle on demand using the application. This scheme uses an alcohol sensor and a panic switch for the safety of the children. In case of emergency, the status of the bus is known to the school organisation as well as parents. This paper presents experimental results of the system to efficiently track and monitor the school bus.

Keywords:- *Arduino MEGA, School Bus Tracking, Smart-Phone Application, GPS, GSM Technology , Safety and Security Enhancement.*

I. INTRODUCTION

With the increase in number of accidents, traffic and unfortunate events, parents are often concerned about their child's safety. The stress increases when they are not able to track the school bus. Not all the schools have a tracking application, so it is essential to introduce this system in as many school as possible. Using the application , parents would be able to track the school bus when it arrives and departs to and from the school. The live location can be tracked by the parents.

The school organisation and parents can continuously monitor the bus and also keep in check with the driver's behaviour. This will ensure the students safety while pick up and drop off. In case of emergency, the scheme helps the parents to receive immediate location notifications. If the schools installs this application in their bus , accidents can be reduced to a great extent .In case if , any natural events like floods or heavy rainfall occurs, the parents will know that their children might arrive late.
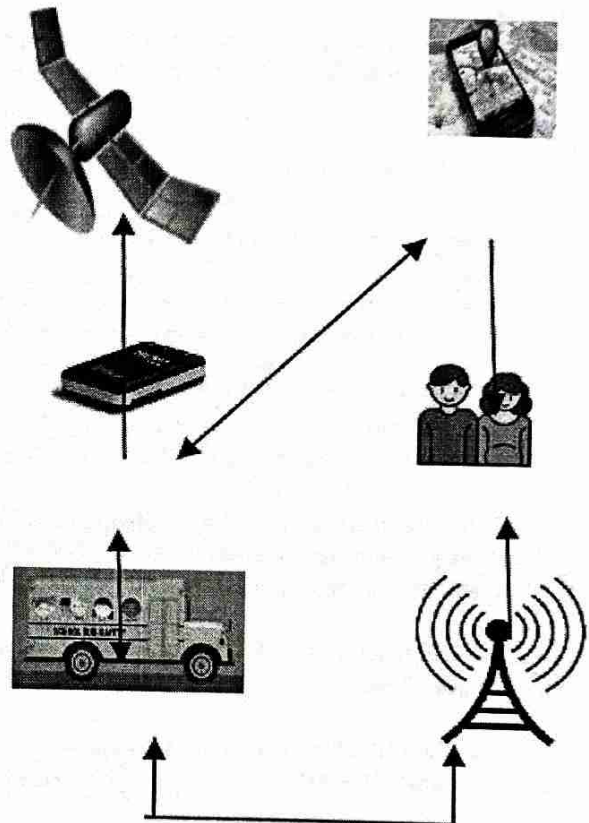

Fig 1:- School bus monitoring and security system

II. RELATED WORK

Vehicle tracking systems are used in many fields such as vehicle position tracking systems, fleet management systems and anti-theft tracking systems.

A. "Design of vehicle tracking system"

SeokJu Lee, Girma T, Jaerock K had developed and tested a vehicle tracking system to track the exact location of a moving or stationary vehicle in real time. The system was able to experimentally demonstrate its effective performance to track a vehicles location anytime from anywhere.

B. "Security Driving Using IoT"

A.Anusha had proposed a method for accessing the quality of vehicle tracking system using IoT. The work survey introduced the monitoring of the driver's sleeping pattern.

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Beacon Based SDR Communication System

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Keywords:

SDR, Radio Communication, Beacon, Transmitter, Receiver, Pipelining, Efficiency, Delay

Abstract

The Software defined radio (SDR) is an advanced type of radio communication that provide a more flexible design for the wireless and mobile industry. In this paper we are proposing methods which can increase the efficiency of SDR. The beacon, Multi transmitter and receiver, pipelining and parallel processing are some techniques used for enhancing the system. We are proposing a system that will improve power efficiency of SDR and will reduce delay of SDR using beacon based technique.

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Different Brain Tumor Detection Techniques: A Review

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Abstract— Brain tumor detection and classification is one of the most active research areas in medical image processing field. The brain tumor segmentation of the MR image is time consuming manual task. Segmentation is a difficult task because tumors in MRI have different size, shape, location and intensities. In this paper, we have described various brain tumor segmentation techniques. Another challenging task is to classify the image into different classes such as malignant-benign, glioma-meningioma etc. In this paper we present various segmentation and classification techniques.
Key words: Image Processing, MRI, Soft Computing, Segmentation, Feature Extraction

I. INTRODUCTION

Brain is the vital part of the human body. Brain tumor is a very serious disease which occurs because of uncontrolled growth of cells in the brain. There are different type of tumors which occur in the brain, such as malignant and benign. Benign is a non cancerous tumor, grow slow while malignant tumor is a cancerous tumor, grow fast and causes serious harm to the brain causing death. Brain cancer is again divided into glioma and meningioma. Brain cancer is the leading cause of the death from cancer. There are two main types of cancer, according to their stage, i.e. primary and secondary. Primary cancer found rarely. It is mainly found in brain tissue and Spread in spinal cord, but not another part of the body. Another type is secondary cancer which originates in another part of the body and spread into the brain. Such a cancer is known as metastatic cancer. Risks of the brain cancer are more who have a family history of brain cancer and people who had radiation therapy of the head. The brain cancer is curable when it is diagnosed at early stages and treated early.

The Neurologist is the specialist who diagnosed the brain cancer. There are different techniques to diagnose the brain cancer, but the popular one is the brain magnetic resonance imaging (MRI) or CT scans.

II. GENERALIZED BRAIN TUMOR DETECTION SYSTEM

The generalized structure of any brain tumor detection system using medical images is as shown in figure 1. The system mainly consists of six sections those are listed as below,

1) Image Acquisition
2) Image Pre-processing
3) Image Segmentation
4) Region of Interest
5) Feature Extraction
6) Classification

A. Image Acquisition

Acquisition of the image is the first step of image processing. The MRI images having low contrast and small volume nodules. Brain MRI images can be acquired from publicly available databases. The MRI images can be collected from the radiologist.

B. Image Pre-processing

The aim of the pre-processing is to improve the image data and minimize the effect of noise. The MRI images containing the least amount of noise, but to get more accuracy of the system, the small noise has to get removed. Hence we need pre-processing step. The pre-processing of the images goes through following two steps.
1) Image Smoothing
2) Image Enhancement

Image smoothing suppress the noise of the image and suppress the small fluctuation in an image. The image enhancement improves the perception of an image.

To improve the image perception smoothing filter such as media, Gaussian, Gabor and histogram, equalization techniques were mostly used.
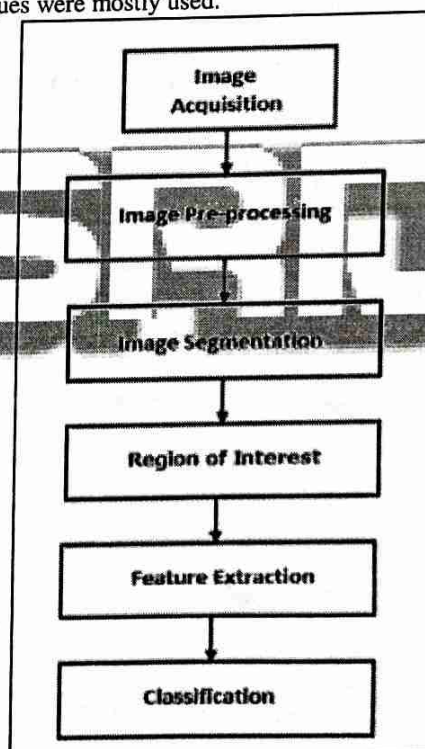

Fig. 1: Generalized Brain tumor detection system using medical images

C. Image segmentation

Image segmentation is a process where the image is divided into smaller part and then classified according to the application. Image segmentation is a crucial process for most image analysis consequent tasks. The accuracy of the system mostly depends on the segmentation results.

Methods such as thresholding, watershed algorithm, region growing algorithm can be used for segmentation purpose.

Simulation of human powered flywheel motor energized process machine through electrical cum electronic analog circuit and its mathematical modelling*

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Abstract. During last almost four decades, technology of Human Powered Flywheel Motor Energized process machines is established fairly satisfactorily. The process units tried are mainly rural/village/ interest or socio economic need based. While trying application of HPFM for any new application, present approach of intuition based speculation and determining parameters of process unit by trial and error and associated information has proved to be time taking and costly. Hence a need is felt of establishing simpler and quick simulation of this machine system. This is only possible by simulating a machine system by electromechanical analog circuits. This is essentially achieved in this paper. In addition mathematical model of this electromechanical analog circuit and its optimization is established.

Keywords: human powered flywheel motor, electronic/ electromechanical analog

1 Introduction

The first Human Powered Flywheel Motor (HPFM) energized process machine for manufacturing lime fly-ash sand bricks with rectangular cross section was developed by Modak in the period of 1979-1982[1,3,4,5] The schematic line sketch of this machine system is as shown in Fig. 1.
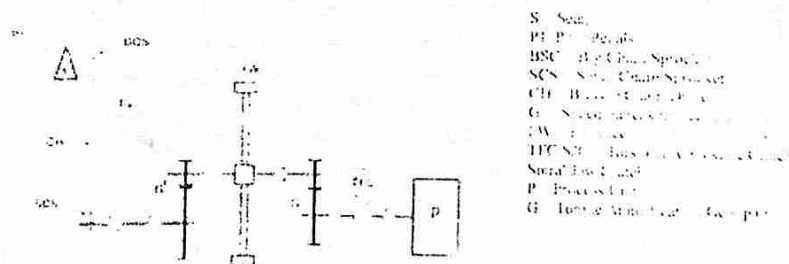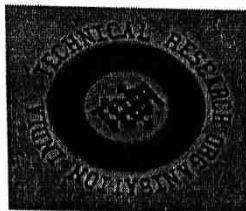

S Seat
Pi P Pedals
BSC Big Chain Sprocket
SCS Small Chain Sprocket
CH Brass Chain Drive
G ...
FW ...
HCS? ...
Small Sprocket and
P Process Unit
G Torque Amplification Gear pair

Fig. 1: Schematic Arrangement of the machine system

ABILITY EVALUATION OF PAC TO REMOVE COLIFORM ORGANISMS AND REDUCE SLUDGE VOLUME IN WATER TREATMENT

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ABSTRACT

This paper describes the performance evaluation studies of ECORITE PAC-2010 for removal of total, feacal coliforms and to reduce sludge volume from waters of different turbidities of natural origin and synthetic water samples. ECORITE PAC-2010 is a coagulant Poly Aluminum Chloride (PAC) a product of M/s. Shriram Consolidated Limited (DSCL). The removal of coliforms from municipal water and their possible harmful effects are major problems to tackle, making use of special processes and methods to remove coliforms from municipal water seems so essential to avoid the health risk. ECORITE PAC-2010 acts as a good coagulant over a wide range of turbidity and produces larger and more rapidly settleable flocs than the alum with reduced sludge volume and also removes the coliform organisms from the water. It was observed that the coliform removal efficiency of ECORITE PAC-2010 and alum show a similar trend over a different turbidity of the test water under the test.
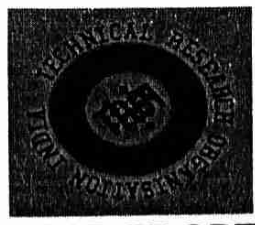
1. INTRODUCTION

Coliforms are a group of bacteria that are widespread in nature. The coliforms are used as indicators of possible water contamination because they are commonly found in human and animal feces. Although they are generally not harmful themselves, they indicate the possible presence of pathogenic (disease causing) bacteria, viruses, and protozoans that also live in human and animal digestive systems. Therefore, their presence in streams suggests that pathogenic microorganisms might also be present and that consumptions of such contaminated water might be a health risk. In addition to the possible health risk associated with the presence of elevated levels of fecal bacteria, they can also cause cloudy water, unpleasant odors, and an increased oxygen demand. For drinking water, total coliforms are still the standard test because their presence indicates contamination of a water supply by an outside source.

Coagulants are those substances which are capable of removing colloidal impurities from water and coagulation is the process by which such removal is brought about. Alum has been traditionally used as a coagulant in water treatment for over hundred years. It is commonly available, relatively inexpensive and has long been recognized as a successful compound for removal of colour and turbidity from water supplies. However, more recently attention has been directed to alternative coagulants in water treatment in efforts to reduce more efficiently turbidity, residual aluminium in finished water, minimize sludge production[1], eliminate post precipitation of aluminium residues in the distribution systems [2], reduce TOC and microorganisms in water. The Poly Aluminium Chloride is an effective coagulant for removal of turbidity [3][4], organic matter [5] [6] [7], fluorides, heavy metals, dyes [8] landfill leachates [9], and coliforms [10]from water. PAC gives more

ANALYSIS OF MECHANICAL PROPERTIES OF DIFFERENT BAMBOO SPECIES BY USING EXISTING ADHESIVES IN MARKET

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ABSTRACT

The paper details the evaluation of mechanical properties and comparison with the different bamboo species. The mechanical properties of the bamboo joints are performed using the present adhesive during the experimentation. The properties such as tensile strength, compressive strength, shear strength and bending strength were tested on 50 specimens of bamboo species with different adhesives using universal testing machine. Ten specimens of each joint is prepared using the single adhesive. All such bamboo samples prepared by different adhesive were laid for 7 days for drying. During experimentation it was observed that the mechanical properties of bamboo species with asian paints (Loctite touch) adhesive are found to be better as compared to the other bamboo species with different adhesive. Samples for the tests were prepared from the timber bamboo and African Bamboo. The bamboo is ease available in the rural areas in bulk.

Keywords: Mechanical properties Specimen, Adhesive , Tensile test, Compression test, Shearing test, Bending test, Reinforce, Interfacial bonding.

1.1Introduction

Mineral resources available in the earth are now reaching its limits. Steel reinforcement used for constructions, furniture, machinery and other applications may be replaced by the development of bamboo. The bamboo setups are developed for sustainable development. These set up are used to sustain the mechanical applications. As bamboo have the features of growing fast with high yield, as well as high intensity, rigidity, thermal stability, and other strengths in physical performance. Bamboo used for the mechanical applications is further enhanced by appropriate bamboo adhesives at bamboo joinery. As bamboo being a natural material. It is abundantly available in most of the part of world. It can be a replaced for steel in reinforced concrete structure for green building. Only option to the costly construction and furnishing materials is available with bamboo.

1.2 Literature Review

1.2.1. Utilization of bamboo as a low cost structural material.

Abdullah, A.A.A. (1983), Proceedings of the Symposium on Appropriate Building Materials for Low Cost Housing, Nairobi, 7-14 Nov. 1983 and E & F N Spon, London and New York: 177-182.

The work presented on the utilization of bamboo as a low cost material of construction is described. Mechanical properties as well as propagation techniques relating to some local species are presented.

1.2.2. An alternative to steel: Bamboo- A review.

Authors: Sandeep Bharadwaj, Rupali Sharma, Rajendra Kumar, detailed that the bamboo can be replacing steel in low and medium structures. As bamboo is having low cost, environmental friendly and sustainable. Here discussed

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Kinetic Study of Oxidation of Nitrophenol Present in Waste Water using Ferrous Sulphate

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Abstract

The detoxification of wastewater containing nitro aromatic compounds is very difficult due to its resistance to oxidation. Therefore, it becomes important for the chemical industries to apply an efficient pre-treatment method to reduce the level of these compounds. In this study, Fenton oxidation treatment of industrial waste water containing nitro-phenol with Ferrous Sulphate is reported. Kinetic study of de-colorization and degradation reactions in terms of the effect of doses of Fe^{2+} H_2O_2 and contact time is studied. The maximum COD, total organic carbon and colour removal efficiency is found to be 93%, 80% and 99%, respectively in 2 h at 132.3 mM H_2O_2 concentration and 10.74 mM Fe^{2+} dose.

Keywords: Nitro- compounds, Fenton oxidation, de-colorization, degradation.

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SYNTHESIS, CHARACTERIZATION AND MATHEMATICAL MODELING OF CHELATIONION-EXCHANGE APPLICATIONS OF COPOLYMER RESIN

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ABSTRACT

p-Hydroxybenzaldhyde and Oxamide with Formaldehyde (BOF) Copolymer was synthesized by the condensation polymerization technique. The elemental analysis and physico-chemical parameters of the copolymer were measured. This chelation copolymer was characterized by infrared, electronic and nuclear magnetic resonance (^{1}H &^{13}C. NMR) spectral studies. The molecular weight of the copolymer was determined by gel permeation chromatography (GPC). Surface analysis of the copolymer was analyzed by scanning electron microscopy (SEM) and X-ray diffraction (XRD) method. The thermal stability of the copolymer was analyzed by thermogravimetric analysis (TGA). The cation-exchange property of the copolymer was determined by batch equilibrium method with the effect of pH, contacttime and electrolytes. The reusability of the resin was also studied to estimate the effectiveness of the copolymer resin.

An attempt has been done to present the metal ion selectivity of the resins with respect to time in the form of mathematical model. The model consists of two straight-line equations, involves all dependent and independent parameters. Graph obtained from actual experimental data is very much comparable to the graph plotted from the data provided by the model. This has been clearly shown by the reliability of the model, which is 94.6%.

Key words: Synthesis, Chelation, Resin, Copolymer, Characterization, Batch equilibrium Method.

INTRODUCTION

The term copolymerization refers to the simultaneous polymerization of three monomers together.Ion exchange may be defined as the reversible exchange of ions between the substrate and surrounding medium. Ion exchange technique can remove traces of ion impurities from water/process liquors and given out a product of ultra pure quality in a single efficient and techno-economically viable manner. Ion exchangers are widely used in analytical chemistry, hydrometallurgy, antibiotics, purification and separation of radioisotopes and find large application in water treatment and pollution control

The discharge of heavy metals into watercourses is a serious environmental problem that significantly affects the quality of the water supply. Increasing concentrations of these metals in the wastewater constitute a severe health hazard because of their toxicity, persistence in nature, and non-biodegradability, particularly when they exceed the permissible limits [1]. Heavy toxic metal ions are generally found together in a hydrometallurgical, recycling or wastewater process, preliminary separation of those metals ions are very essential at this juncture. Synthesis of o-nitrophenol and thiourea with p-formaldehyde terpolymer has been reported and its chelation ion exchange properties were investigated by static batch equilibrium method [2]. Lutfor et al [3] prepared a chelating ion exchange resin containing amidoxime functional group and was characterized by FT-IR spectra, TG and DSC analyses and chelating behaviour of prepared resin was studied with Cu (II), Zn (II), Ni (II), Cd (II) and Pb (II) metal ions. Samir et al [4]

ABILITY EVALUATION OF PAC TO REMOVE COLIFORM ORGANISMS AND REDUCE SLUDGE VOLUME IN WATER TREATMENT

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ABSTRACT

This paper describes the performance evaluation studies of ECORITE PAC-2010 for removal of total, feacal coliforms and to reduce sludge volume from waters of different turbidities of natural origin and synthetic water samples. ECORITE PAC-2010 is a coagulant Poly Aluminum Chloride (PAC) a product of M/s. Shriram Consolidated Limited (DSCL). The removal of coliforms from municipal water and their possible harmful effects are major problems to tackle, making use of special processes and methods to remove coliforms from municipal water seems so essential to avoid the health risk. ECORITE PAC-2010 acts as a good coagulant over a wide range of turbidity and produces larger and more rapidly settleable flocs than the alum with reduced sludge volume and also removes the coliform organisms from the water. It was observed that the coliform removal efficiency of ECORITE PAC-2010 and alum show a similar trend over a different turbidity of the test water under the test.

1. INTRODUCTION

Coliforms are a group of bacteria that are widespread in nature. The coliforms are used as indicators of possible water contamination because they are commonly found in human and animal feces. Although they are generally not harmful themselves, they indicate the possible presence of pathogenic (disease causing) bacteria, viruses, and protozoans that also live in human and animal digestive systems. Therefore, their presence in streams suggests that pathogenic microorganisms might also be present and that consumptions of such contaminated water might be a health risk. In addition to the possible health risk associated with the presence of elevated levels of fecal bacteria, they can also cause cloudy water, unpleasant odors, and an increased oxygen demand. For drinking water, total coliforms are still the standard test because their presence indicates contamination of a water supply by an outside source.

Coagulants are those substances which are capable of removing colloidal impurities from water and coagulation is the process by which such removal is brought about. Alum has been traditionally used as a coagulant in water treatment for over hundred years. It is commonly available, relatively inexpensive and has long been recognized as a successful compound for removal of colour and turbidity from water supplies. However, more recently attention has been directed to alternative coagulants in water treatment in efforts to reduce more efficiently turbidity, residual aluminium in finished water, minimize sludge production[1], eliminate post precipitation of aluminium residues in the distribution systems [2], reduce TOC and microorganisms in water. The Poly Aluminium Chloride is an effective coagulant for removal of turbidity [3][4], organic matter [5] [6] [7], fluorides, heavy metals, dyes [8] landfill leachates [9], and coliforms [10]from water. PAC gives more

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A Transient Thermoelastic Analysis in A Semi-infinite Solid Cylinder with Laser Consecutive Pulses

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ABSTRACT

In this paper a problem of heat conduction in a semi-infinite solid cylinder when the laser consecutive irradiation pulses with a Gaussian intensity profile within the cylinder is solved. Both the energy absorption depth and the time decaying effects were considered. The heat conduction equation is assumed to be a transient state, and the integral transform technique is employed in solving the governing equations. On account of the general nature of the boundary conditions and heat absorption source considered, the solution of the problem of heat conduction yields many useful and interesting cases. The theory of thermoelasticity based on solution of Navier's equation in terms of Goodier's thermoelastic displacement potential, Michell's function and the Boussinesq's function for cylindrical co-ordinate system have been used for discussion and analysis of thermal stresses. Some numerical results for the temperature change, the displacement, and the stress distributions are shown in figures.

Keywords: semi-infinite cylinder, heat conduction, heat absorption source, potential functions, thermal stresses.

1. INTRODUCTION

Laser heat treatment finds wide application in metal industries. Laser heating alters both the mechanical and structural properties of the treated metallic parts. These alterations are related to the heating and cooling rates and the instantaneous temperature gradients between the surface and the base substrate. Consequently, the development of heating models

Performance Evaluation of Thematic Mutual Fund Schemes Using Capital Asset Pricing Model (CAPM)

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ABSTRACT

In Today's era, as earning money is important so as the Investments since just earning money is not enough. As we are working hard to earn the money, our money should also work hard for us, this is why we invest. Money lying idle in our bank account is an opportunity lost. We should invest that money smartly to get good returns out of it. For a novice Investors, it is being advised to adopt a particular investment strategy and diversify their portfolio, as through Diversification overall investment risk can be reduced.

Various investment options have been provided by Indian capital market to the investors, to help them to invest in various sectors and organizations and to ensure the profitable return. Among various financial products, Growth and developments of various mutual funds products in the Indian capital market has proved to be one of the most catalytic instruments in generating momentous investment growth in the capital market. Many AMC's Floated lots of schemes for the investors to invest their surplus savings. In this context, close evaluation of mutual funds has become essential. Hence, picking out profitable mutual funds for investment is a very important issue. This study, basically, deals with the Thematic based Infrastructure Mutual fund schemes in India.

This study mainly focused on the performance of selected Infrastructure equity mutual fund schemes in terms of risk- return relationship. The main objective of this research work is to analyze financial performance of selected Infrastructure mutual fund schemes through the statistical parameters such as (Average annualised Return, beta, standard deviation, Capital Asset Pricing Model). The findings of this research study will be help full to investors for their future investment decisions.

Keywords: Mutual funds, Infrastructure mutual fund schemes, investors

1. INTRODUCTION

Mutual fund is a mechanism for pooling the resources by issuing units to the investors and investing funds in securities in accordance with objectives as disclosed in offer document. Investors need to know how risky individual assets are and what their contribution to the total risk of a portfolio would be.

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One Step Combustion Synthesis and Photoluminescence of Red Emitting Phosphor $Y_4Al_2O_9$:Eu^{3+}

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Abstract. Eu^{3+} doped $Y_4Al_2O_9$ phosphor were prepared by modified combustion route employing mixed (Urea + Glycine) fuel. XRD pattern indicates that the sample structure belongs to single phase monoclinic. The effect of dopant concentration on Photoluminecence properties were investigated. Under 249 nm excitation, the red emission are observed at 609 nm. The emission intensity of $Y_4Al_2O_9$:Eu^{3+} phosphor increases with concentration of Eu^{3+} ion from 0.5% to 2.5% . Further increase in dopant concentration shows decrease in emission intensity thereby exhibiting the phenomenon of concentration quenching.

INTRODUCTION

Phosphors based on aluminum oxide doped with rare earth ions present optical properties proving most of the solid-state lasers available. Aluminum–yttrium oxides, for instance, are interesting compounds, which have been extensively used as hosts for lasers and phosphors [1]. These systems have been described in literature in three different kinds of crystal phases: $Y_3 Al_5O_{12}$ (YAG), $YAlO_3$ (YAP) and $Y_4 Al_2O_9$ (YAM), [2]. The former two compounds doped with rare earth ions are promising phosphor materials and their photoluminescence properties in the range of VUV–vis were widely studied [3,4]. However, only a few spectroscopic investigations on YAM host doped with rare earth ions have been reported [5–8]. Xia et al. [6] have synthesized the $Y_4Al_2O_9$:Eu^{3+} phosphor through a sol–gel combustion method, where the $Y_4Al_2O_9$ phase can form through sintering at 800 ^{0}C. Shengli Liu et al. have also prepared the $Y_4Al_2O_9$:(Tb^{3+},Eu^{3+}) by sol–gel process [5]. Recently, Wang et al. [8] have studied the VUV excitation and photoluminescence characteristics of these $Y_{3.8}Al_2O_9$:$Re_{0.2}$ (Re = Tb^{3+}, Eu^{3+}) phosphor synthesized via a citric-gel method. This phosphor shows strong absorption in VUV region. The results indicate that this phosphor could be one of the potential candidates for PDPs applications.

Though several soft chemical routes have been explored for synthesis of YAM, most of these methods are complex and high cost for the industrialization. The methods like sol–gel process and hydrothermal synthesis require expensive chemicals or equipment and involve procedural complexity. Moreover, phase pure materials are not obtained in one step and prolonged annealing at temperatures around 1000°C is necessary. In this paper, we describe one step combustion synthesis of YAM carried out at 500°C furnace temperature. Activation with Eu^{3+} could also be achieved during the synthesis without taking recourse to any post combustion thermal treatment.

We successfully prepared YAM:Eu^{3+} powders by this method. Synthesis and photoluminescence characterization of these phosphors are described in this paper.

Photoluminescence And Energy Transfer In $Ce(PO_3)_3$:Nd^{3+}

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Abstract. A study of the luminescence properties of Nd_2O_3 doped $Ce(PO_3)_3$ is presented in this paper. Non radiative energy transfer takes place from Ce^{3+} to Nd^{3+} ions. The dominant mechanism of concentration quenching is the multipolar interaction. Lifetime measurements showed significant reduction in lifetime of doped compound for 295 nm excitation. The efficient NIR emission in Nd^{3+} ions doped $Ce(PO_3)_3$ as reported here can have useful applications in c-Si solar cells.

INTRODUCTION

The coordination chemistry of cationic sites have a strong influence on the luminescent properties of lanthanide ions in both the orthorhombic and monoclinic crystal structures of $Ln(PO_3)_3$ (Ln = La to Lu and Y)[1].Such inorganic materials, when doped with rare earth ions like Yb^{3+} or Nd^{3+} along with other lanthanides, have emission in the same region where the spectral response of c-Si solar cell is high. Hence they are utilized for spectral conversion. Many researchers have reported near infrared (NIR) emitting phosphors involving downshifting, downconversion or Upconversion process [2-4]. Nd^{3+}- ions have partially forbidden f-f transitions with low direct excitation efficiency, sharp absorption lines and quite a longer lifetime in the range of microseconds to milliseconds. When introduced in several hosts, it gives emission in UV, blue, green, orange, red and IR regions of spectrum. Nd^{3+}- ions are used as luminescent centre, due to its important lasing transitions around 900 nm, 1067 nm and 1350 nm. The c-Si solar cell has best spectral response to solar spectrum in the NIR region from 860 to 1100nm. [5] The NIR emission of Nd^{3+} ions is found to most suitable for possible applications in c-Si solar cells. The NIR emission of Nd^{3+} is reported in several hosts like YAG [6], CaS and SrS [7], $LaCaAl_3O_7$ [8] where Ce^{3+} ions acts as sensitizer. Among phosphates.$LaPO_4$ co-doped with Ce^{3+}-Nd^{3+}/Yb^{3+} [9], Ce^{3+} and Yb^{3+} codoped$Gd(PO_3)_3$[10] have been reported. In present investigation, we are reporting for the first time NIR emission in $Ce(PO_3)_3$:Nd^{3+} phosphor which were successfully prepared and their spectroscopic properties are discussed.

EXPERIMENTAL

To prepare $Ce(PO_3)_3$:x%Nd (x = 0,0.01,0.05,0.10,0.12) solid state reaction technique was used. CeO_2, $NH_4H_2PO_4$ and Nd_2O_3 were used as starting materials. The mixture of these compounds taken in proper stoichiometric ratio and finely crushed in an alumina crucible. Sintering was done at 250, 500 and 900°C for 2, 5 and 15 hours respectively in a programmable furnace [11]. Philips PANalytical X'pert Pro X-ray diffractometer was used to study the X-ray diffraction pattern of the prepared samples to verify the formation of phase pure compounds. The photoluminescence spectra (PL) were recorded on a Hitachi F-7000 fluorescence spectrophotometer. For readings in NIR range, QM- 51 NIR Spectrophotometer was used. Lifetime measurements of the prepared samples were done on HORIBA make Time-Correlated Single Photon Counting (TCSPC) machine.

Advances in High Efficiency Crystalline Silicon Homo Junction Solar Cell Technology

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Abstract. Due to the high energy crisis all over the world, the use of renewable energy resources such as solar energy and wind energy are becoming more common all over the world. One of the most popular types of renewable energy is solar energy. The semiconductor device that converts sunlight (solar energy) into electricity is termed as Solar cell or photovoltaic (PV) cell. Photovoltaic cells with materials involving, mainly silicon in both crystalline and amorphous form, II-IV and III-V semiconductor materials and many other inorganic and organic materials are used in this industry. Among all these materials, crystalline Silicon (c-Si) is one of the most commonly used material for photovoltaic cells because of its abundance and non-toxicity and Silicon homojunctions are the building blocks of many microelectronics devices and standard crystalline silicon (c-Si) solar cells. In Silicon homo junction solar cell, the inability to absorb all the incident sunlight fundamentally limits the Si solar cell efficiency. Therefore, for single-junction devices, there is a theoretical limit for solar cell efficiency depending on the absorbing material, called the Shockley-Queisser limit. Other challenges involved in the use of silicon homo junction solar cells in the PV industry are their high manufacturing cost and lengthy manufacturing processes required for fabrication. To lower costs and increase efficiency many solution approaches such as –to reduce the number of processing steps involved in the manufacture of N-type PERT silicon solar cell, to improve the c-Si material quality, development of passivating layers to prevent surface recombination of carriers, development of metal contacts with low contact resistivity, texturing of c-Si wafer and deposition of ARC coating etc. have been proposed. This paper reviews the current methods designed and developed to achieve the high efficiency in crystalline Silicon Homo junction solar cells with low process cost.

INTRODUCTION

Solar cells are the devices which converts sunlight energy into electricity through the photovoltaic effect. Edmund Becquerel was first scientist to discover the photovoltaic effect and it was observed in a liquid electrolyte [1]. Later work on Se, Cu-Cu$_2$O, PbS, TIZS, AgZS, and many other materials known as photoconductors or phosphors showed that the photovoltaic effect is very common in some specific material. Photovoltaic effect was also discovered in semiconductor materials such as silicon and GaAs. Other semiconductor materials like Germanium, III-V compounds and ternary compounds also showed a suitable photo voltaic effect. Later usefulness of photovoltaic effect for technical applications such as solar energy was developed.

The photovoltaic effect is caused by the separation of photo-generated minority carriers from the majority carriers by a built-in electric field and the consequent flow of these carriers through an external circuit to recombine [1]. A discontinuity or marked changes in the materials used have been found very common in all photovoltaic cells [1]. This discontinuity has been responsible for the creation of a built in potential, resulting in the separation of photo-generated charge carriers. This build-in potential is used for the power generation of the solar cell. According to the type of the change or discontinuity, there are two kinds of primary photovoltaic cells-homo-junction and hetero-junction.

The discontinuity in homo-junction cell is in the type of the conductivity of the material from n-type to p-type [1]. The region over this discontinuity change occurs is called as the p-n homo-junction. Homo-junctions are

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Concentration Quenching and Luminescence Decay in Yb^{3+} doped Cerium Tri-metaphosphate

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Abstract

The compounds Yb_2O_3 doped $Ce(PO_3)_3$ were synthesized using solid state reaction method. New results on photoluminescence in $Ce(PO_3)_3$ are reported. Energy transfer was observed from Ce^{3+} to Yb^{3+} ions. Concentration quenching was observed above 5% Yb^{3+} doping in $Ce(PO_3)_3$. Luminescence decay measurements established that energy transfer took place from Ce^{3+} to Yb^{3+}. Lifetime measurements showed considerable reduction in lifetime of doped compounds. Non radiative energy transfer takes place from Ce^{3+} to Yb^{3+} ions. The effective mechanism of concentration quenching seems to be the multipolar interaction. Such materials have desired applications in production of C-Si solar cells.

Keywords: Cerium metaphosphate; Photoluminescence; Solid state synthesis; Energy transfer; Luminescence decay

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Article

Simple Harmonic Oscillator in k-MOND

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Abstract

Pankovic and Kapor in 2010 proved a possibility that Milgrom's modified Newtonian dynamics, MOND can be interpreted as a theory with the modified kinetic terms of the usual classical Newtonian dynamics, simply called k-MOND. In this work we used this possibility and tried to find the Newtonian and k-MOND analogue of behaviour of Simple harmonic oscillator.

Keywords: Euler-Lagrange equation, kinetic energy, Lagrangian, MOND, potential energy, simple harmonic oscillator.

1. Introduction

A new Lagrangian functional of the simple harmonic oscillator has been proposed. The derived equation of motion is *almost* same as that of the conventional Lagrangian functional. The equation of motion is derived from Euler-Lagrange equation by performing partial derivatives on the Lagrangian functional of the second variation of the calculus of variations.

The simple harmonic oscillator model is very important in physics (Classical and Quantum). Harmonic oscillators occur widely in nature and are exploited in many manmade devices, such as clocks and radio circuits. They are the source of virtually all sinusoidal vibrations and waves. Highlighting the behavior of simple harmonic oscillator in view of the modified kinetic energy, due to Pankovic and Kapor in MOND theory by Milgrom, its Newtonian analogue is reclaimed.

When the uniform velocity of rotation of cluster of galaxies was first observed (Oort 1932 and Zwicky 1933) it was not in tune with Newtonian theory of gravity. The galaxies or stars sufficiently away from the centre of the cluster move with constant velocities more than predicted by the theory. The most widely accepted approach to explain this problem postulates the existence of the dark matter. However, even after seven decades, there is no convincing evidence of the dark matter. In an attempt to explain the observed uniform velocities of galaxies without dark matter hypothesis, Professor Milgrom in 1983 propounded an equation of motion which resulted into a theory, known as MOND (*Modified Newtonian Dynamics*), which is a phenomenological scheme whose basic premise is that the visible matter distribution in a galaxy or cluster of galaxies alone determines its dynamics. In MOND the Newton's second law of motion is generalised as

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Article

Cosmological Model with Global Equation of State in Presence of G & Λ

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Abstract

In this paper generalized cosmological model is obtained in the presence of global equation of state of the form $p = (1/3)\rho\phi$ where ϕ is a scale factor. Also discussed the cases of matter dominated universe and radiation dominated universe under the condition of $G = G_0(R/R_0)^{n-2}$. The corresponding physical interpretations of the cosmological solution are also discussed.

Keywords: Global equation, cosmological model, matter, radiation.

Introduction

In the Kaluza-Klein and Super String theories higher dimension have acquired much significant. It has also been suggested that the experimental detection of the time variation of the fundamental constants could provide strong evidence for the existence of extra dimensions (Alvarez and Cavela, 1983; Marciano, 1984; Randjbar-Daemietal,1984).

The theory of gravitation using G and Λ as non-constant coupling scalar has been used by Beesham (1986) and Abdel Rahman (1990). The motivation was to include a G coupling constant of gravity as a pioneer by Dirac in (1937). Also motivation with the work of Ibotombi (2007) and Mukhopadhyay et al. (arXiv: 0711.4800v1,(2007), in this work we studied 5D Kaluza-klein type metric with perfect fluid and variable G and Λ.

If we assume the equality of gravitational and inertial mass and gravitational time dilation in Einstein theory we must require that the equation of motion of particle and photon does not contain G and Λ. In any case the strongest constraints are presently observed G_0 value and observational limit Λ_0. Sistero (1991) found an extra solution for zero pressure models satisfying $G = G_0(R/R_0)^{n-2}$. Barrow (1996) formulated and studied the problem of varying G in Newtonian Gravitation and Cosmology. Exact solution and all asymptotic cosmological behavior are found for universe with $G \propto t^{-n}$.

In this paper we have obtained exact solution for Zeldovich fluid models satisfying $G = G_0(R/R_0)^{n-2}$ with global equation of state of the form $p = (1/3)\rho\phi$, where ϕ is a function of scale factor R. In the second part of this paper we have also discussed the cases of matter dominated

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Game Theory Solution by Linear Programming Method with New Optimal Pivot Approach

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Abstract

In this paper, a new optimal pivot approach to the solution of Game theory problems by Linear Programming method is introduced which is based on the iterative procedure. New optimal Pivot rule not only solves cycling problems but also leads to an optimal improvement of the objective function at each iterative step. The proposed new technique is computationally more efficient and easier as compared to traditional simplex method. We test and compare the efficiency of this new pivot approach with Dantzig's original pivot rule.

Key words: Game Theory, Linear Programming, Optimal Pivot Approach

Introduction

The mathematical study of strategic decision making is known as Game theory. Game theory problems combine both the mathematical and theoretical foundations of game theory with a series of complex applications. Many practical life problems required to take decision in a competing situation when all opposite parties concerned with conflicting interests and the outcome. Decision-making study done by Game theory approach when two or more intelligent and the rational opponents are involved under conditions of conflict and cooperation. It is mainly used in applied mathematics, politics, social sciences, economics, as well as in biology, engineering, political science, international relations, computer science and philosophy. In 1920 the major development of the game theory began with the work of the John von **Neumann**. In 1928, Neumann described minimax theorem (how two players can minimize their losses against each other). In 1944, the book "Theory of games and economic behavior" by von Neumann and Oskar Morgenstern which involves a groundbreaking mathematical theory of economic and social organization, based on a theory of games of strategy. In 1951 **Brown** determined Iterative Solution of Games by Fictitious Play in Activity Analysis of Production and Allocation.

Dantzig in 1951 studied maximization of linear function of variables subject to linear inequalities. In 1969, **Gass** published book on Theory of Linear Programming. **Neill** in 1987 studied non metric test of the minimax theory of two-person zero-sum games. In 1994 **B"orgers** published work on Weak Dominance and Approximate Common Knowledge. In 1995 **Weibull** analyzed Evolutionary Game Theory and discussed its application. In 2001 **Tang** gives some experimental results for anticipatory learning in two-person games. In 2001 **Combe** analyzed general normal form games solutions. In 2009 **Lamba** studied alternative approach to revised simplex method. In 2012 **Lamba** determined alternative approach to Wolfe's modified simplex method for quadratic programming problems. In 2013 **Ghadle** suggested New Approach to find solution of Linear Programming Problem. In 2013 **Lamba** gives solution of game theory problems by KKL method.

Transient thermoelastic analysis in a semi-infinite cylinder with a sectional heat supply on a surface

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Abstract

This paper is concerned with a transient thermal stress of the axisymmetric problem of a semi-infinite hollow cylinder on consideration of an internal heat source that are generated according to the linear function of the temperature. In addition, assuming that an end face of the cylinder is heated with sectional heat supply having radiation-type boundary conditions. The solutions obtained for the temperature distribution of the cylinder is analysed based on theory of integral transformations technique. Thereafter, the thermal displacements and its associated thermal stress distributions are determined with the aid of thermoelastic potential functions method and Love's displacement function method.

Keywords: Heat conduction, stress, semi-infinite cylinder, potential functions.

1. Formulation of the Problem

It is assumed that a semi-infinite cylinder is occupying the space $D:\{(r,z)\in R^2 : a \le r \le b, 0 \le z < \infty\}$ under unsteady-state temperature field due to internal heat source within it.Let the cylinder in which internal sources are generated according to alinear function of the temperature are subjected to sectional heatingover the upper curved surface at $(z=0)$.

1.1 Temperature distribution

The equation for heat conduction is $\theta(r,z,t)$,the temperature, in cylindricalcoordinates, is

$$\frac{\partial \theta}{\partial t} = \kappa \left[\frac{1}{r}\frac{\partial}{\partial r}\left(r\frac{\partial \theta}{\partial r}\right) + \frac{\partial^2 \theta}{\partial z^2}\right] + \Theta(r,z,t,\theta) \tag{1}$$

in which thermal diffusivity $\kappa = \lambda / \rho C$, λ being the conductivity of the material, ρ is the density and C is the calorific capacity, and $\Theta(r,z,t,\theta)$ is the source function

Putting

$$\Theta(r,z,t,\theta) = \Phi(r,z,t) + \psi(t)\theta \tag{2}$$

and

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An improved multiclass support vector machine classifier using reduced hyper-plane with skewed binary tree

Pranav S. Bagawar ✉ & Kishor K. Bhoyar

Abstract

Support Vector Machine (SVM) is mainly used to classify the data into two categories. To solve the multi-category problems using SVM, researchers used two approaches. The first approach based on solving multiple SVM binary classifiers, whereas another approach based on solving a single optimization problem. In this paper, we have used the first approach and proposed an Efficient Multiclass Support Vector Machine (ESVM) algorithm using a skewed binary tree. To construct the skewed binary tree, no extra efforts are required as compared to the binary tree approach. The algorithm is tested on the benchmark data sets, and the results are compared

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Priyadarshini College of Engineering, Nagpur

Amit Raut , Sachin Kadam , Roshan Pawade , Mayur Gawande , Harshal Ramdham, Dr. (Mrs.) N. M. Thakre

Department of Computer Technology A Survey on Control and Monitoring of Home Appliances using Internet of Things (IOT).

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Abstract: The main goal of this paper is to describe the systems which automatically control the devices through mobile through Internet. The various implemented systems are used to control appliances in the house like fan, light, and water tank or tap by just turn ON or OFF the switch from mobile phone. Internet-of-Things (IoT) is elaborate by the internet services. IOT Applications and Uses of new technologies in IoT environment are increasing rapidly. It has been already developed in Industrial Wireless Sensor Network (WSN). A smart home is also one of the applications of IoT. Rapid growth in technologies and improvements in architecture comes out many problems that how to manage and control the whole system, Security at the server, security in smart homes, etc. This paper presents the architecture of Home Automation using IoT. Digital homes are those where home appliances/devices could monitor and control remotely. When these household devices in digital homes connect with the internet using proper network architecture and standard protocols, the whole system can be called as Digital Home in IoT environment or IoT based Digital Homes. Digital Homes ease out the home automation task. This paper presents not only the problems and challenges come in

IoT and Digital homes system using IoT but also some solutions that would help to overcome on some problems and challenges.

Keywords : Internet of things (IOT), Node-MCU, Relay circuit , Sensors, Web services, Arduino

I.   Introduction

In the recent years various technologies are developed which helps people to get self control systems. These systems first sense the data from the sensor and by processing on that provide output for controlling. And this control action is taken by the mobile application as it provides a much faster alternative than mobile web browsing. It has made human life more easier and comfortable. Now we are going to familiar with these technologies.

Internet has changed human's life by providing anytime, anywhere connectivity with anyone. As many advancement in technology has been come the sensors, processors, transmitters, receivers, etc. are now available very cheap rate. Hence these all things can be used in our day to day life [4]. If anyone wants to expand the services of internet then Internet of Things can be said as the expansion of internet services [1]. Today's internet is now expanding towards Internet of Things (IOT).
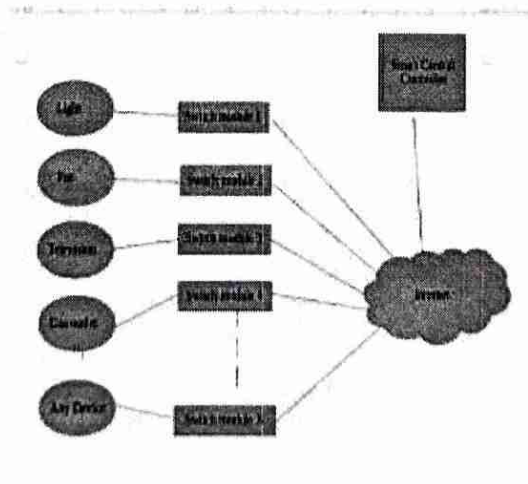

Fig. 1.1: Basic idea for Smart Home System using IoT

Smart Electricity Board Android Application

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Abstract: Smart Electricity Board Android Application suggests a mobile based system to collect, process and notify consumers about consumption. This system will be reliable, efficient and accurate to suit the requirements of the providers. Meter reading, even though looks simple, is far from simple and involves processes which are not expedient. Calculation errors and delays in system updating are the major problems involved. Here we aim to eliminate the manual processes involved in the electricity meter reading system and eliminates the need of a user. It measures and monitors the electricity consumed by consumers in a locality and forwards the consumed power to the board which in turn notifies the power consumption with the help of GSM, GPS and Android. Our system reduces the cost of labor involved, increases the accuracy of meter reading and saves a large amount of time.

I. Introduction

Smart Electricity Board Android Application is basically a software for the electricity board which suggests a mobile based system to collect, process and notify consumers about their consumption. Electricity is one of the vital requirements for the sustainment of comforts of daily life. In our country, there are localities where we have surplus supply of electricity while many areas do not even have access to it. The current techniques for meter reading in India are not fully automated. The meter readings obtained from the energy meter are used to calculate electricity bill. The energy providers hire people who visit each house and record the meter readings manually. These meter readings are input to the system at the office by the back entry officer. The consumers are not pleased with the services of their providers. They have complaints regarding the statistical errors in their monthly readings.

Smart Electricity Board Android Application aims to receive monthly energy consumptions from remote locations to the board. It aims to minimize the technical errors and reduce human dependency at the same time. Our system helps to reduce the workload of the meter readers. Our project involves the use of a GPS which continuously monitors and records the energy meter readings. The system also makes use of a GSM modem for remote monitoring and control of energy meter. Short Messaging System (SMS) cell broadcasting feature to send the meter readings to the server.

Android is used as a means to notify the consumers about their monthly consumptions and perform monthly calculations at the electricity board. Thus the system is an effective way for collection of data. This reduces the need for a meter reader .It also provides consumer greater accuracy, improved billing, reduces cost etc. It offers better customer services, by sending alert of power cuts and consumption updates. It is very useful for remote areas or small villages which are not connected by any means of transport.

Further reading includes various sections describing the project work in detail. Section two gives an idea about the related work done and researches done in the area of automated meter reading. Section three gives an overview of the system which includes the study of the existing system and detailed discussion and design of the proposed system. Section four discusses about the implementation and the results obtained. It also deals with the various approaches taken to make the architecture 'something better'. The last section finally concludes the research work and discusses the future scope of the research in relevance to the further study.

Related Work

Traditional metering methods for retrieving the energy data is not convenient and the cost of the data logging systems are high. There are many projects that works with the aim of eliminating the manual processes involved, from the time the meter reader starts reading the meter until the system isupdated with the current reading. Automatic Meter Reading system (AMR) is a boom for remote monitoring and controlling domestic energy meter. AMR system gives the information of meter reading, power cut, total load used, power disconnect and tempering on request or regularly in particular interval through SMS. The providers could get any information about the meter once a request is issued from their consumer GPS location.

Projects like, Smart Energy Meter Using Android Application and GSM Network has been

A Survey on Energy Monitoring System using Internet-of-Things

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Abstract-The energy audit may range from a simple walk-through survey at one extreme to one that may span several phases. These phases include a simple walk-through survey, followed by auditing of energy use in the industries, and then analysing usage of computer representation of industrial operations. The complexity of the audit is directly proportional to the stageinvolved in the energy management program and the cost of the audit exercise. Remote monitoring and control refers to a field of automation that is entering a new age with the development of wireless sensing devices. Different industries sensors, machineries, energy or the power panels are the most demanding products and hence many organizations are in requirement of remote monitoring system. Keeping both the important points in consideration, proposed has been designed to implement the remote energy parameter monitoring system for energy audit and analysis. The proposed hardware modules are device with inbuilt functionality to work as a web client to communicate directly with web services. Providing microcontroller web functionality through GPRS protocol and reading meter parameter over MODBUS protocol is most challenging part of the system.
Keywords- Internet of Things(IoT), MODBUS, GPRS protocol, Automation, Energy Audit.

I. Introduction

In 2017, average electricity consumption in India is 1149 kwh per capita, in which industrial consumption is 41.48%. This number can be reduced by decreasing energy waste through the Internet of Things (IoT). According to researchers, "The IoT is a system ofinterrelated computing devices, mechanical and digital machines, objects, animals, or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction"[2]. Significant progresses can be made in conservation of energy by using field data obtained from intelligent devices installed in substations, feeders, and various databases and models across the utility enterprises. Information acquisition is a key for timely data sensing, processing, and knowledge extraction. So far, the most talked-about information about power network operations is from data collected from intelligent electronic devices installed in substations and various parts of the transmission and distribution networks [3]. In recent years, smart meters are being installed in homes and other premises in many regions of the world [3].

Monitoring System Functions have been logically groupedin four layers that are presented with a top-down approach, starting from the end users' specifications to the low-level data acquisition requirements [4]:
A. Information Presentation
B. Data Correlation and Analysis
C. Data Classification, Transformation and Storage
D. Data Acquisition, Collection and Adaptation

A. Information Presentation
A suitable Software Layer for Information Presentation is required on top to provide appropriate and value added information to several involved responsibility levels in the organization and even to external stakeholders [5].
B. Data Correlation and Analysis
The Monitoring System Software for Data Correlation and Analysis, that feed the upper layer presentation software with value added information, should be modular and scalable to allow a progressive introduction of the needed functions in
accordance with the priorities and the growing knowledge and awareness of the Organization [4].

A Survey on Smart Self Issuing System

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Abstract—*Issuing is a tedious task involve sorting, lending, returning, tagging, eyeing of every item. In addition, users encounter problems for finding, borrowing, localizing, renewing the borrowing, queuing, and so forth. To overcome these obstacles, this paper proposes a smart self product issuing system based on an RFID technology. Using low-cost passive tags in libraries, stores to reduces the cost of modernization significantly. As such, integrating RFID into product management system makes both the users and admin's task easy, smart, convenient, and practice.*

I.   Introduction

It is found in every store that the searching of items is tedious task. Self-issuing system provides a fast and easy way to issue or return items during store opening hours. .By using our software as a technology the item can be issued after the user or customer enters the store. And if the store is closed for any particular time so at that time the person can reissue that item from anywhere. But if any other user wants to issue the same item then our software will send an SMS on the registered contact number of that borrower. The typical functions of the store management like fine calculation , user status will be provided with the additional functionality like the theft detection and the runtime machine generated SMS, etc.

Many of our current stores for example libraries use "bar code" and "magnetic" mode to manage items, and the librarian use a laser scanner affixed with a bar code on the item to scan the statistics of the item and update and input the information[5-8].By making the use of Radio Frequency Identification (RFID) system which is a new generation of Auto Identification and Data collection made easy through Smart Self Issuing System is presented in this paper. It helps to automate business processes and allows identification and management of large number of tagged objects like items, using radio waves.

II.   Existing Systems Disadvantages

1.Manual product issue and check in / check out system.
2.Long queue for purchasing and issuing.
3.Separate staff required to manage issuing of products.
4.Barcode can only be used to scan one item at a time.
5.Barcode is not good option for security verification.
6.The consumer finds it difficult to locate the specific item.
7.No option to self-check in / check out and individual profile management.
8.No notification system if user delayed product re-issue or return.
9.The main idea is to "design and deploy an intelligent self-product issuing system" to improve productivity and reduce labor cost.
10.Providing self-product issue, re-issue and return mechanism.
11.Provide stock management including inventory monitoring, identification of missing or lost items, and locating items on shelves.
12.Eliminate time-consuming processes when checking items out of the items
13.Implement item security measures against possible thefts often occurred using RFID technology.
14.Easy profile tracking and notification management for product return or re-issue status.

III.   System Overall Design

The system mainly uses the RFID technology to locate the items [13-15]. The hardware of the whole system is modularized, and the whole system is composed of the upper computer, the reader module, the antenna module and the electronic tag. The reader module comprises a controller module, a radio frequency

Visual Positioning System In 3D Space

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ABSTRACT—

With the application and development of technologies based on user location information, location-based services are now growing at a rapid pace. In this paper we present VPN application which is used to navigate in large complex areas such as urban region where VPN application is used to navigate, it provides pop up in real time on application screen with the information of nearest cluster of data. It is android based application which does not requires any external hardware other than mobile phones. This application is used for better navigational guidance in urban areas.

KEYWORDS: GYROSCOPE; ACCELEROMETER; BEARING ANGLE; EMULATOR; COMPASS.

I. Introduction

Due to the increasing popularity of location-based services, the need for reliable and cost-effective indoor positioning methods is rising. As an alternative to radio-based localization methods, in 2011, we introduced MoVIPS (Mobile Visual Indoor Positioning System), which is based on the idea to extract visual feature points from a query image and compare them to those of previously collected geo-referenced images. The general feasibility of positioning by SURF points on a conventional smartphone was already shown in our previous work. However, the system still faced several shortcomings concerning real-world usage such as request times being too high and distance estimation being unreliable because of the employed estimation method not being rotation invariant. In this paper, three extensions are presented that improve the practical applicability of MoVIPS. To speed up request times, both a deadreckoning approach (based on step counting using the accelerometer) and an orientation estimation (based on the smartphones compass) are introduced to filter relevant images from the database and thus to reduce the number of images to compare the query image to. Furthermore, the vectors of the SURF points are quantized. For this purpose, clusters are calculated from all SURF points from the database. As a result, each image can be represented by a histogram of cluster frequencies, which can be compared with each other a lot more efficiently. The third extension is an improvement of the distance estimation method, which uses the matched feature points of an image to perform a perspective transformation and to determine the actual position with the aid of the transformation matrix.

WORKING
Phase 1:Identifying All Sensors Values

1) Accelerometer:
The motion sensors in accelerometer is used to identify the orientation of device using axis-based motion sensing which can even be used to detect earthquakes, and many by used in medical devices such as bionic limbs and other artificial body parts.

2) Compass Direction:
A compass is an instrument used for navigation and orientation that shows direction relative to the geographical cardinal directions.

3) Longitude:
Vertical mapping lines on earth of longitude, known as "meridians". One simple way to visualize this might be to think about having hula hoops cut in half, vertically positioned with one end at the North Pole and the other at the South Pole.

Cda Generation and Integration Based On Cloud Computing

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Abstract: *Organization for electronic Health record helps us to enhance persistent security and nature of care, yet it has interoperability as an earlier condition between Health data exchange at various healing facilities. To guarantee interoperability between the wellbeing data exchanges at various clinics the CDA built up a center document by utilizing HL7, where as the center report engendering is basic for interoperability. A portion of the healing facilities are hesitant to embrace the interoperability due its sending cost. The healing centers began utilizing CDA arrange as alternate records are difficult to oversee. Considering the above issue we will portray the CDA document era and Integration Open API benefit in view of distributed computing. This helps the healing facilities to empower advantageously and create CDA record without having any issues in regards to programming.*
Keywords: *Clinical Document Architecture, Health information Exchange, HL7, Saas.*

I.   Introduction

Distributed computing alludes to the applications which are conveyed as an administration over the web, equipment and programming frameworks to the server farms. The distributed computing has three noteworthy administrations as said underneath –

1 .Software as an administration (Saas)- Helps clients and associations in a manner that there is no requirement for them to run a specific application on a specific stage. The product upkeep, establishment and support are the principle benefits for Saas.

2. Platform as an administration (Paas)- Cloud gives a registering stage where the customer can conveytheir own particular applications and programming dialects .

3. Infrastructure as an administration (Iaas)-Are the self administration models which are utilized for getting   to,checking   and   overseeing   information structure foundations which have benefits as register, stockpiling and systems administration.

Electronic Health record (EHR) is the accumulation of health data about the individual and it can bolster the productive procedures for human services. For a Successful operation of EHR a health data Exchange framework (HIS) must be required [1]. Powerful Healthdata exchange help to institutionalized and interoperable health data exchange between healing facilities. Health level seven has built up CDA as a standard for clinical reports[2]. Clinical Document design is a report markup standard that has the structure and semantics of "Clinical Documents" for the use of exchange data. The activities embracing CDA have effectively done in numerous nations. There is a need of HIS to bolster CDA and the structure of CDA is substantial where the reports are difficult to accomplish without finish comprehension of the CDA standard[3]. Clinics have the HIS advancement stages for era of CDA records in every healing facility requires a different CDA framework [4].On the off chance that any vital for arrangement of care, doctor's.

A CDA report is recorded the finding is created when a patient is touched base to the center. On the off chance that the patient consents to share the CDA document to different facilities and it can create the report. The exchanging of CDA document is as per the following Patient facility report can be shared to different centers and knows the answer from different doctors too. At the point when a patient is in crisis then medicinal history should be audited, yet it postpones   the   record   since   more reports   are   aggravated   in   various   documents.   All   the   CDA records are incorporated into single CDA report to survey the therapeutic history in sequential request. In this paper we introduce a CDA   record   era framework creates a report on various creating stages and CDA   document incorporation framework that coordinates numerous documents in various clinics for every patient.   The   principle advantage of receiving the framework is to access through an Open API and designers can work on their engineer stages, for example, java, .NET,C/C# .Hospital framework can broaden the current framework as opposed to supplanting another framework. It is pointless   for   doctor's   facilities   to   create and incorporate the standard CDA reports. The cloud CDA era produces records in the CDA organize.

An Iot Based Smart Parking System

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Abstract: Internet of Things (IOT) plays a vital role in connecting the surrounding environmental things to the network and made easy to access those un-internet things from any remote location. It's inevitable for the people to update with the growing technology. [1] And generally people are facing problems on parking vehicles in parking slots in a city. In this study we design a Smart Parking System (SPS) which enables the user to find the nearest parking area and gives availability of parking slots in that respective parking area. And it mainly focuses on reducing
3the time in finding the parking lots and also it avoids the unnecessary travelling through filled parking lots in a parking area. Thus it reduces the fuel consumption which in turn reduces carbon footprints in an atmosphere
Keywords: Smart Parking, IoT, NodeMCU, Ultrasonic Sensor, Arduino IDE, smart city, etc.

I. Introduction

As evolving this latest burning technology Internet of Things, it promises to connect all our surrounding things to a network and communicating with each other with less human involvement. Still internet of things is in beginning stage and there is no common architecture exists till today [1] There is lot of researches and implementations are currently being going on in all the respective areas. Thus there is no guidelines or boundaries exists to define the definition of internet of things. So depending on the context, application the internet of things has different definitions. Shortly it is defined as the things present in the physical world or in an environment are attached with sensors or with any embedded systems and made connected to network via wired or wireless connections.

Implementation: -
Ultrasonic ranging module HC - SR04
Features: -
Provides 2cm - 400cm non-contact measurement function, the ranging accuracy can reach to 3mm. The modules include ultrasonic transmitters, receiver and control circuit. The basic principle of work:
(1) Using IO trigger for at least 10us high level signal,
(2) The Module automatically sends eight 40 kHz and detect whether there is a
pulse signal back.
(3) IF the signal back, through high level, time of high output IO duration is
the time from sending ultrasonic to returning.
Test distance = (high level time*velocity of
sound (340M/S) / 2

NodeMCU 1.0 ESP8266 12E
MCU ESP8266EX is embedded with Tensilica L106 32-bit micro controller (MCU), which features extra low power consumption and
16-bit RSIC. The CPU clock speed is 80MHz. It can also reach a maximum value of 160MHz. Real Time Operation System (RTOS) is enabled. Currently, only 20% of MIPS has been occupied by the Wi-Fi stack, the rest can all be used for user application programming and development.

Circuit Diagram: Below circuit diagram shows the interfacing of the ultrasonic sensor with NodeMCU Wi-Fi module. Ultrasonic sensor works on the concept of sound waves. The sensor measures the distance which can be used to check whether the vehicle is parked or not. The range of distance measurement varies from 2 cms to 400 cms. The status of the parking slot is saved in the database and the continuous monitoring is kept on the status. If the car is parked the slot shows red color and if the slot is available, it shows the green color. This is very easy method for parking a vehicle in the city. NodeMCU device is used to upload the distance on the server and the

Survey Of Security Mechanisms For Atm Based Transactions

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Abstract— *In the past few years' robbery of ATM card has increased, in the present system pin number is used for ATM transaction security, which can be easily Phished, guessed or misused by many ways, with this person can lose money from his/her account without the person's authorization. The main objective of this work is to propose a system, which is used for ATM security applications. Here authorized Bank officials will register the customer details such as Mobile Number with their Official Bank Database while opening the accounts then customer can access the ATM machine with the help of the QR-Code generated and the OTP Sent on the Registered mobile number. When the customer enters ATM he must scan the QR code generated on ATM screen from his mobile phone, wherein he automatically gets a Randomly generated 4-digit code (OTP). Every time this code is sent as a message to the mobile of the authorized customer through GSM module connected to the particular ATM. The code received by the customer should be entered by pressing the keys on the keypad, after that he will be able to do for further transaction from the mobile app. If someone try to physically damage the system or try to evade the system without authorization, then the ATM shutter gets shut and locked down automatically till the Security officials arrive. This proposal will go a long way to solve the problem of ATM transactional Security.*

Keywords—— ATM, GSM module, QR-code card, OTP, Mobile

I. Introduction

In today's fast life no-one wants to stand in long queues for banking operation, they don't want to wait for too long thus many of us use ATM machines. Fast development of banking technology has various advantages and Disadvantages to banking activities and transactions are the advent of automated teller machine (ATM). ATMs are electronic banking machines located in different places and the customers can make basic transactions without the help of bank staffs. With the help of ATM, the user can perform several banking activities like money transfer, cash withdrawal, credit card payment, paying various domestic bills like electricity, and phone bill.

The rapid development of banking technology has changed the way banking activities are dealt with. One banking operation that has impacted positively or negatively to banking activities and transactions is the advent of Automated Teller Machine (ATM). It is a computerized machine designed to dispense cash to bank customers without need of person-to-person interaction. Today the ATM users are increased in number. They use ATM cards for banking transactions like deposits, transfers, balance enquiry, mini statement, withdrawal, fast cash, etc. The ATM machine has card Reader and keys as input devices and display screen, cash dispenser, receipt printer, speaker as output devices. (Available present day security) Account information of user is stored on the magnetic strip present at the back side of the ATM card. When a person enters this card in the card reader, the card reader captures the account Information and the data that is required for the transaction. The person has to insert the ATM pin for security authorization by use of keys / touch- pad present on the system. The pin is the unique 4-digit number registered with particular ATM card given to the Account holders. The number is verified by the bank and allows the customers to access their account. The password is the only authentication required so anyone with this 4-digit pin can access the account when they have the combination of both the card and Pin. Once the card and the Pin is stolen by the culprit they withdraw money from the account with the Account Holders Authorization, it may bring huge financial losses to the Card holder.

In this paper discusses some of the techniques that involves use of QR code to prevent the fraud at the time of ATM transaction. The QR code measure is an attempt for enhancing the current security loophole of the banking

Women Safety Application

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Abstract: *In today's world it is very unsafe to travel alone, especially for women. Since lots of unexpected, and shameful incidents are happening around the globe. Problems may come from anywhere and anytime, as women are also growing equally like men so for that purpose they have to travel alone at night where ever they go, they have to travel alone in public transport as well, and for that reason we need to understand and solve this problem of women so they also should not feel any fear regarding their safety. This report represents an android application which will serve the purpose to rescue the women from unsafe conditions. As we all Know that nowadays every individual carry their own smartphones and the uses of android applications have been increased rapidly so it is better to have such an android application which will provide a safe environment in public transport.*
Keywords: *Android, Database Management, PHP.*

I. Introduction

If we are to fight discrimination and injustice against women we must start from the home, for if a women cannot be safe in her own house then she cannot be expected to feel safe anywhere. A recent article in India claimed that India is the fourth most dangerous place for women's to take public transport and the second worst for safety while travelling at night.

The most awful Delhi bus gang rape in 2012 is just the tip of the iceberg when it comes to the dangers of taking public transport as a woman. This rape incident occurred on 16th December 2012 at a place Munirka, a neighborhood in south Delhi which was a fatal assault. A 23 year old woman a physiotherapist was hit by a gang while she was travelling in a public transport (bus) with a male friend. Another such incident of TCS software engineer took place at Bhandup where the body has been found after two days near Kanjurmarg suburb, this incident was parallel just to the one evoked by Nirbhaya case in Delhi. One more case taken place in Mumbai where woman was travelling to her native place and she got kidnapped and killed. This is the small contribution taken which will provide safety android app for women.

Users will allow to scan the QR code placed inside the vehicle and the number plate of it will be sent in the text message format to the contacts which user selects. It lets your family and friends know your current via GPS tracker if your android device is connected to the network.

II. Literature Survey

The existing system of others application provides the user alerts to your closed ones or by standers with your location in a situation of distress or emergency.And will inform and update your closed ones if you are stuck in an unsafe place.

Sauver: An Android Application for Women Safety:

This app can be activated by a single click when the user feels the danger. This application sends the user's location to the registered contacts for every few seconds in the form of message. Thus, it acts like a sentinel following behind the person till the user feels safe. The key features of this application are along with the user's location, one of the registered contacts gets a phone call. Also, the registered contacts and GPS location are saved in a database. This app continuously fetch the location for interval of every 30 secs and send it to saved contact. So we can easily track the user and it will also send the location in form of URL or latitude and longitude coordinates of location.

Priyadarshini College Of Engineering, Nagpur Online Staff/Student Web Crawler

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Abstract: *PCE Staff/Student Portal provides a simple interface for maintenance of student–faculty information. It can be used by scholastic institutes or colleges to maintain the lettering of students readily. The creation and management of righty, update tidings regarding a student's academic career is critically vital in the university as well as colleges. Student vital system deals with all kind of student details, alumni student data, college details, course details, batch details, placement details and workshop attened other resource related details too. All these will be achievable through a safe, online alliance embedded in the college's site .The Staff / Student Portal is the commonly used phrase to describe the login page where student can provide a user name and password to gain access to an scholastic organization's programs and other learning related materials. For sample a novice who has enrolled in an online certification program may utilization a student portal to ingress online course parent materials, such as articles, lectures and videos hosted on the college's server. Staff/student portal is also used to provide vital about the college, special events, course details, calendars, academic resources and contact material.*

Keywords: *Database, HTML, PCE Staff/Student Portal College Portal, SQL.*

I. Introduction

The PCE Staff/Student Portal is a web portal where all information and all services that students need can be found in one place. The Portal can be used by all student registered at PCE Staff/Student and all faculties of PCE portal. This venture is an online portal for students and faculty. This system conceded college faculty of important data gathered. It consists of a faculty login along with student login .In this application all data available such as Alumni student, T&P data, Paper Publication data and Workshop Attended, All the data stored on the portal. The impingement of computers on our lives today is probably much more than we are actually known to Confiscating good information and transforming it swiftly into products than consumers craving to closeout is the cardinal key to staying in business and this all is done coeval using Computers and Application Software. College Portal defines as an application (more likely web-based), that endow abilities for multiple users with different permission levels to manage (all or a section of) content, data or information of a website project, or internet / web application. The software scheme Managers to plan and control the organizational operations and to respond to changing market conditions. It endow a regular flow of vital for managerial decision-making and control.

A) Objective

The main objective of this system, is to reduce the regular use of time during maintaining the records of college. Separate divisions are providing to maintain the records of teachers students students. Our System also endow an foolproof way not only to automate all functionalities of a college, but also to endow full functional reports to top management of college with the finest of details about any facet of college. In other words, our college portal has, following objectives: Simple database is maintained. Easy operations for the operator of the system. User interfaces are user friendly and tempting; it takes very less time for the operator to use the system. The aim is to design a college website which contains update vital of the college that should improve efficiency of college record management.

B) Problem Statements

There are many case found in the todays portal system. The problems created in the existing system enforced us to develop the new system which minimize the problem of the existing system. Now a days the

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Design & Implementation of a 9-level H-bridge Inverter Fed Induction Motor with Low Harmonic Values

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Abstract- A Multilevel structure with more than five levels can significantly reduce the harmonic content. The output voltage and power increase with number of levels. Adding a voltage level involves adding a main switching device to each phase.

This research presents a universal control scheme based on phase shifted carrier PWM method and its implementation in 3-level, 5-level and 9-level cascaded inverters feeding a three phase induction motor. This research compares total harmonic distortion values of voltage and current waveforms of induction motors between different levels. It stresses on improving the efficiency of multilevel inverter and quality of output voltage waveform.

Progressively new 5-level, 7-level and 9-level inverter schemes have been developed with reduced switches. The MATLAB simulation is done and hardware is implemented by using MOSFET's & IGBT's for the switches of 5 and 7 level inverter respectively. Simulation is done for 9-level inverter and simulation results and THD is observed. The hardware of 9-level inverter is designed using IGBT's and an induction motor load is run on it. Using this scheme, we can control the speed and also reduce the noise and vibration of the Induction motor.

Keywords – IGBT, Multilevel inverter, H-Bridge, phase shifted carrier PWM, Induction motor, etc.

I. INTRODUCTION

Multilevel converters can be applied to utility interface systems and motor drives. These converters offer a low output voltage THD, and a high efficiency and power factor. There are three types of multilevel converters: (1) diode clamped, (2) flying capacitors, and (3) cascaded. The main advantages of multilevel converters include the following:

1) They are suitable for high-voltage and high current applications.

2) They have higher efficiency since the devices can be switched at a low frequency.

3) Power factor is close to unity for multilevel inverters used as rectifiers to convert ac to dc.

4) No Electromagnetic Interference (EMI) problem exists.

5) No charge unbalance problem results when the converters are in either charge mode (rectification) or drive mode (inversion).

The multilevel converters require balancing the voltage across the series-connected dc bus capacitors. Capacitors tend to overcharge or completely discharge, at which condition the multilevel converter reverts to a three-level converter unless an explicit control is devised to balance the capacitor charge. The voltage-balancing technique must be applied to the capacitor during the operations of the rectifier and the inverter. Thus, the real power flow into a capacitor must be the same as the real power flow out of the capacitor, and the net charge on the capacitor over one cycle remains the same.

II 9-LEVEL INVERTER DESIGN

The general structure of the Modified cascaded multilevel inverter is shown in Figure 13. This inverter consists of an H Bridge and multi conversion cell which consists of four separate voltage sources (Vdc1, Vdc2, Vdc3 and V dc4), four switches and four diodes. Each source connected in cascade with other sources through a circuit consists of one active switch and one diode that can make the output voltage source only in positive polarity with several levels. Only one H-bridge is connected with multi conversion cell to acquire both positive and negative polarity.

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④

Effect of Inverter Harmonics on Performance of Induction Motor

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Abstract – *As a use of power electronics circuitries in the field of control strategy of induction motor is increasing, their impact on the performance of induction motors needs further consideration. Approximately 70% of loads in all over the world are motor loads. More than 95% of these loads are consumed by three phase induction motors with a big utility factor between 0.7-0.9 in a day and most of them are used in industry. So, study of their conditions under heavy harmonic polluted supply would be interesting for understanding of that how we should treat with the biggest electric load of the world. Harmonics measurement of an industrial unit is done to assel the power quality aspects in a Industry, then by considering a cause and effect of supply voltage harmonics, a design procedure was suggested so that lifetime and operating efficiency of Induction motor increases.*

Keywords- *Harmonics, Induction Motors, efficiency*

I- INTRODUCTION

The application of nonlinear loads as a result of power electronic circuitry is growing very fast. In general view, the shape of supply voltage can't be sinusoidal and motor manufacturers have to consider non-sinusoidal conditions in their designs. The harmonics of supply voltage effect on operation of all electrical equipment like relays, that are the guards of power system, measurement equipment, and electric motors, that are the wheels of industries. In fact, all of these equipment have been designed to work in normal conditions, but in real networks the power is non-sinusoidal that reduces the motor efficiency and their lifetime [2]. Temperature rise of machines is the most effective parameter that decreases the age of insulation [3], and consequently the lifetime of the machine that mainly depend on the condition of its insulation. High temperature of the insulation declines its age exponentially [4]. Many parameters like different load cycling, switching, working in hot weather, harmonics and unbalances loading condition are major reasons in temperature rise of the motors. The motor losses consist of mechanical and electrical losses. Mechanical losses that caused by

friction and windage are not affected by harmonics [5], but electrical losses that consist of Iron, Winding and stray load losses depend on order and magnitude of harmonics present in the supply. Hysteresis loss and eddy current loss that take place in the Iron varies with the square of the air-gap voltage. The harmonics currents are proportional to the magnitude of voltage harmonics, i.e. the stray load loss and winding loss vary with the square of the voltage harmonic.
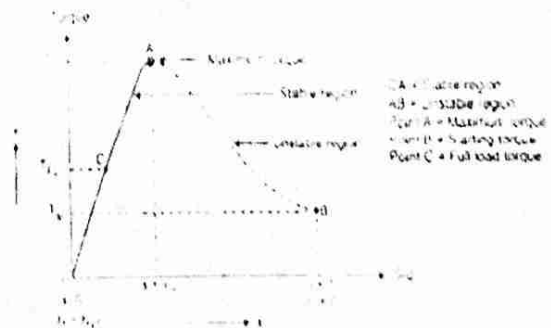
II- OPERATING CONDITION OF MOTOR

Fig. 1-Torque speed characteristics

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Study Of Five Level Diode Clamed Inverter Fed 3 Phase Induction Motor Drive System For Various Parameters

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Abstract-The main aim of this study is to find out the harmonics effect of the source on the performance of the induction motor with different accepts for various application.

If the current or voltage waveforms of power source are distorted from its ideal form it will be termed as harmonic distortion. This harmonic distortion could result because of many reasons.

Keywords—Switching;current harmonics;distortion.

I-INTRODUCTION

The electrical drives is a combination of an electric motor and its electric supply system. Thus analysis cannot always be limited to the electric drives but have to be extended over the whole electric drive from the shaft-end to the electric input power supply.

The main aim of this study is to explain the effect of harmonics distortion of the input power fed through the multilevel inverter related to the deviation in motor torque torsional vibrations, etc

A. Problem Statement

The output voltage in a conventional two level inverters are square wave in nature and it contains number of odd harmonics, which causes various losses in the induction motor and affects the performance. Thus by increasing the number of levels, Total Harmonic Distortion and losses in the Induction Motor can be reduced".

B. Couses of harmonics

Various industrial loads including static converters (such as electric furnace, induction heating devices and switching power supply) inject current harmonics in power systems. Generally power electronic devices such as switching sources and converters are most important sources of harmonic generation. Converters usually generate harmonics from nth level in AC side, given by

$$n = k\, n_p \pm 1$$

Where

k - is a constant and

n_p is the number of converter pulses.

II. EFFECT OF INVERTER HARMONIC

1. Third Harmonics Third harmonic flux waves produced by each of the three phases neutralize each other as it differs in time phase by 120o. Thus air gap flux does not contain third harmonics and its multiplies. The fundamental mmf wave produces flux which rotates at synchronous speed which given as ns = 120 H/P rpm where H is supply frequency and P is number of poles.

2. Fifth Harmonics. Fifth harmonic mmf wave produces flux which rotates at 120 H/5P ns 5 rpm and in direction opposite to the fundamental mmf wave

Optimization Study of Fuzzy Parametric Uncertain System with Observer

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Abstract - This paper deals with the analysis and design of the optimal robust controller for the fuzzy parametric uncertain system. An LTI system in which coefficients depends on parameters described by a fuzzy function is called as fuzzy parametric uncertain system. This paper mainly studies uncertainty in the system. By optimal control design, we get control law and feedback gain matrix which can stabilize the system. The robust controller design is a difficult task so we go for the optimal control approach. The system can be converted into state space controllable canonical form with the α-cut property fuzzy. For optimal control design, we find control law and get the feedback gain matrix which can stabilize the system and optimizes the cost function. Stability analysis is done by using the Kharitonov theorem and Lyapunov-Popov method. The proposed method applied to a response of Continuous Stirred Tank Reactor (CSTR).To this system we applied an observer to control the system response. Linear regulator controller designs result in a state variable feedback law, so that implementing an optimal control requires measurement of all components of the state. In many situations such measurements are not possible and alternative approaches is needed. One such approach was originated by D. G. Luenberger, and is known as Luenberger observers.

Key Words: Fuzzy parametric uncertain system (FPUS), α-cut set, optimal control Kharitonov theorem, Lyapunov-Popov stability, Continuous Stirred Tank Reactor (CSTR), Disturbance Observer based controller (DOB).

1. INTRODUCTION

To design a proper controller for real time nonlinear system have many problems such as uncertainty, disturbance, unknown exact mathematical model etc. Uncertainty is either structure or Unstructured .Mostly the nonlinear system defined in terms of mathematical model doesn't have the exact parameter the calculated parameters are considered. So that type of model consists the parametric uncertainty. And because of that uncertain parameter, we have some information loss. which may be incomplete, unreliable. Also, the uncertainty affects the system response. So, we must design a controller such that it can deal with this type of uncertainty and removethe effects occurred because of that. For that, the fuzzy logic controller gives the best solution.

Many available system contain nonlinearity characteristics, such as microwave oscillation, chemical process, hydraulic system, etc. It important to study behavior of nonlinear system. The most important part in nonlinear system is Optimization. The dynamic of non-linear system can be strongly depends on either one or more parameter since their operative condition remain stable only if the value of parameters are must be in specific limit. If these parameter gone out of range then the equilibrium point become unstable. Because of this reason, nonlinear controllers like Fuzzy logic controller are used to control such system because they are more robust than other controllers. [2]Fuzzy technique has been widely and effectively used now a days in nonlinear system modelling and control for more than two decades. In many of the model based fuzzy control approaches, the famous t-s fuzzy model is a popular and convenient tool in functional approximation. [3, 4] CSTR is one of the most commonly used non-linear system, which is mostly used in chemical industries, it offers a verity of researches in the area of chemical and control engineering. Due to non-linearity presents in the system, performance of the conventional controller may not be proper. Hence complexity of the system analysis increases. [6] It becomes difficult to have results under certain conditions. So here Type-1 fuzzy controller is used and optimized, for optimization, Jaya algorithm is used, because it is one of the best optimization algorithm which gives good performance and results.

The latter part of the paper is arranged in the following sequence. Section 2 presents type 1 fuzzy controller design and optimization for triangular membership functions and optimization by JAYA algorithm is presented in section 3.

The results of hardware implementation of controllers are presented in section 4. The main conclusions are reached through analysis of results.

2. FUZZY CONTROLLER DESIGN

Most of the available physical dynamical systems in real life, which are not possible to be represented by linear differential equations and have a nonlinear nature. On another side, linear control methods depends on the key assumption of small range of operation for the linear model and, acquired from linearizing the nonlinear system, to be valid. When the required operation range is large, a linear controller is unstable, because the nonlinearities in the plant cannot be properly dealt with the controller. One more assumption of the linear control is that the system model is

Statistical analysis of sunshine based global solar radiation (GSR) models for tropical wet and dry climatic Region in Nagpur, India: A case study

Author & abstract	Download	26 References	3 Citations	Most related

Related works & more	Corrections

Author

Listed: Registered:
  - Makade, Rahul G.
  - Jamil, Basharat

Abstract

In literature, numerous models are available to predict Global Solar Radiation (GSR) on a horizontal surface, which is predominantly a site-specific characteristic. Hence, a comparative study is required to predict GSR using a correct model for a particular site. The principal aim of the present work is to analyze the most precise model for estimation of monthly average daily global solar radiation (MADGSR) on a horizontal surface for the region of interest. In the current work, the performance of 300 existing sunshine based GSR models are compared using 15-year meteorological data for Tropical wet and dry climatic region of India. The accuracy of each model is tested using ten different statistical error tests. Further, the Global Performance Indicator (GPI) is used to rank the selected GSR models. According to results, the Ampratwum Model (Model 274, proposed for Marmul, Oman) has shown the best capability to estimate the GSR on a horizontal surface followed by Srivastava (Model 26, proposed for Kolkata, India) and Rensheng model (Model 282, proposed for China). The results of the present study are valuable for the developing countries and remote areas where very few metrological stations are available since the technological expenses are very high.

Suggested Citation

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RF Communication of Vibration Signal for Condition Monitoring

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Abstract
This paper describes a system for communication of vibration signal using radio frequency. In this work, we are using the fact that vibration analysis provides relevant information about abnormal working condition of machine parts. Vibration measurement is essential for vibration analysis which is used for condition monitoring of machinery. The vibration measurement is done using 3axis accelerometer sensor. The implemented prototype system is based on use of NRF24L01 RF module i.e. standard IEEE802.15.4 for wireless communication. The system provides wireless communication of vibration signal between vibration sensor and vibration monitoring unit. Visual studio software is used for the system interface. It works in real time and can be used at remote places.

Keywords
RF Module, Accelerometer, RF Transmission

Introduction
Bearings of a shaft of any mechanical systems are generally subjected to sever transient load. This intern induces severe vibrations in the bearing caps. If these vibrations are continuously monitored, then we can predict likely machinery failure to occur in near future. But in certain system this continuous monitoring is not possible because of all the time unavailability of experts near the systems. Hence conventional method of monitoring of vibration signal of bearing is to check it periodically but this kind of monitoring is inadequate in certain situations. This situation leads to unawareness of happening of heavy breakdown of a system.

In such situations, there is a need of continuous monitoring of vibrations of bearing. The solution to above problem is to communicate vibration signals continuously to the place where experts are available all the time for monitoring. There is a problem for communicating the signal in urban construction sites or in rural areas. The signal cannot travel at a long distance in remote places, so to overcome this problem this system has been designed. There are different types of wireless communication technologies used for wireless transmission. Like Radio Frequency (RF) Transmission, Infrared Transmission, Light Wave Transmission, Microwave Transmission. But RF Transmission are used commonly because of their property to penetrate through objects. Various protocols are available for RF transmission like ZigBee, Wi-Fi, Bluetooth, WLAN, Wi-Max etc. Bluetooth based systems provide range of only upto 10m, while range of Wi-Fi and Zigbee based systems is from 10-100meters. So these systems are not suitable for the application under consideration.
In our system, we are using wireless RF module due to which data can travel for long distance and in a fast and effective manner [1, 2].
The system is using RF module based transmitter and receiver, Accelerometer for vibration sensing.

Materials and Methods
The system is developed with the help of which we can transmit and receive a signal at a long distance without any interference
A. Transmitter and Receiver
Block diagram of Transmitter and Receiver is shown in figure 1.1 below. Transmitter and receiver consist of RF module for RF transmission and reception. This RF module uses higher order modulation techniques like GFSK. The range here depends upon the type of RF module used for communication. Accelerometer is used to acquire vibration signals of bearings. This vibration signal which is electrical in nature is given to the microcontroller and is displaying it on LCD display. Vibration signal is displayed in digital form on LCD display. We can also observe the vibration signal in analog form on computer screen. Vibration signal is given to RF module. The RF module first up-convert this input signal to RF frequency before transmission. The signal is received by RF module based receiver. RF module at receiver down-convert the signal which is then processed by microcontroller.

B. Accelerometer
Accelerometers are electromechanical devices that convert the mechanical signals, such as vibration and force, to electrical signals, and are extensively used for condition monitoring and fault detection in many machines. Selecting an appropriate accelerometer and the way of mounting it on a process machine bearings are significant factors in determining the success of any condition monitoring system. Various parameters which need to be considered for accelerometer selection are sensitivity, range,

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Development of Dual-Band Antenna for Wireless Applications

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Abstract

The multiband antenna technology has significant impact on today's advance wireless communication networks. The paper presents the design aspects along with analysis of a planar compact dual-band antenna for fulfilling the requirements of wireless applications. The optimized dimension of the designed antenna model is (28 x 36 x 1.6) mm³. The insertion of asymmetric L-shaped strips with variation in dimension such as the length, thickness and a space within the strips have considerable effect on the frequency of resonance of the antenna. The optimization of asymmetric strips and slots is done by performing number of iterations. The prototype is fabricated using FR-4 substrate. The measured result shows that the antenna is operating in 3.4-3.60 GHz and 5.2-5.85 GHz. The resultant frequency ranges are suitable for WiMAX (3.5 GHz) and Wi-Fi/WLAN/HiperLAN (5.5 GHz) bands respectively.

Introduction

The present day wireless advanced communication system shows increasing inclination towards antennas with multiband operations. Although the design of single antenna with multiband characteristics is complex to implement, its demand is still increasing rapidly. The printed monopole structure of antenna is a optimum choice due to its characteristics like compact size, simple structure and low profile. There is also possibility of integrating the monopole structure with Worldwide Interoperability for Microwave Access (Wi-MAX) and Wireless Local Area Network (WLAN) into single system. This is beneficial for mobile devices such as hand-held computers and intelligent phones. This facilitates the user mobility with wireless advance communication system. The major requirement for the same is multiband and wide band operation with simple and compact structure which is easier for fabrication.

The main challenge in designing compact antennas for wireless devices is not only to fulfill the wide and multi band requirements but also capability to provide good amount of efficiency, acceptable gain and omnidirectional radiation patterns. Printed antennas are frequently preferred for wireless communication devices due to their low cost, compact size, light weight, multiband and wide band operation. Numerous printed antennas were presented by several researchers for multiband applications [1]-[10]. A symmetrical inverted-F winding antenna structures were used to generate dual-band characteristics by some researchers [1,2]. A two layer patch with single-feed antenna was designed using E-shaped and U-shaped patches [3]. A mushroom-like rectangular substrate using zero[th] order (ZOR) resonant mode was used to generate the resonance for dual-band operation [4]. A slotted antenna with metal covering for ultra-book applications was discussed by some researchers [5]. A pair of planar and vertically shorted patches with three asymmetrical U-shaped slots was used for high-gain base station dual-band antenna [6]. A hexagonal and circular geometrical shaped patch monopole printed antenna was investigated in some papers [7]. A modified rectangular E-shaped patch with partial ground plane connected through patch via hole was capable for generating dual-band [8]. A diamond-shaped single-layer substrate composition dual-band antenna was also discussed by some researchers [9]. A CPW-fed patch structure slotted antenna with pair of arc-shaped metal strips was used for wireless applications [10].

The main limitation of the antenna discussed earlier is large antenna size and use of fractals, stacked structures. In this paper, an attempt is made to achieve the multiband operation with asymmetric structures with high degree of miniaturization. In this work, a printed microstrip-fed monopole antenna is presented with dual-band operation for wireless applications. The paper is summarised as given below.

The materials with methodologies are given in section 2. The section 2.1 presents the antenna design. The development process of the antenna and antenna dimensions are given in section 2.2. The simulated and measured results are highlighted in section 3.

Certificate of Publication

This is to certify that paper entitled

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1.8
IMPACT FACTOR

By
Organizer ISAR

1

Fabrication of Portable Head for Lathe

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Abstract— A "Portable Head" is attached on conventional lathe machine as to eliminate the need, for an operator owning on a milling machine, slotting machine, shaper machine, drilling machine. It is design to mount on carriage vertically on lathe machine and to be used without disturbing setup in associated In this project work an attempt has been taken so that the operations like keyways, grooves, slotting, tapping, off-set counter boring and off-set counter sinking etc. can be easily performed on conventional lathe. The lathe–milling keyway attachment consist of vertical column, lead screw, handle, drill chuck, pulley etc. The pulley is driven by the motor which is mounted at back side of column with the help of belt drive. The moment of tool can be adjusted by adjusting carriage.

Keywords— Portable head, The lathe–milling keyway, Milling machine, Drilling machine, Casting

I. INTRODUCTION

A single lathe can perform operations like facing turning, centre drilling, taper etc. But it cannot perform operations like offset drilling or slotting these operations cannot be performed on lathe either it perform together. It is simple and flexible device use as individual machine PORTABLE HEAD is able to operate offset drilling, grinding, boring, slotting, milling and operations which cannot perform by lathe. Portable head is special attachment to lathe either it perform together. It is simple and flexible device use as individual machine. The milling-drilling and slotting attachment is commonly referred to use on a Versa Mill. It is a portable unit capable of doing many operations that normally requires a single purpose machines. This is a self-powered, vertical feed, variable-speed precision tool which may be mounted in any position in place of tool post. With a two-directional feed table, the PORTABLE HEAD becomes a complete machining tool for bench or in place machining of parts too large to be moved or held in conventional machine tools.

II. LITERATURE SURVEY AND REVIEW

During the study of our project "FABRICATION OF PORTABLE HEAD FOR LATHE" We visited different workshops and collect more data about the project .We studied in detail working principle required for running of project & studied material required from book We also took references from papers as given below:

A Review on Advance Automation of Conventional Lathe Machine

Now a day, products can be produced by modern technology, which uses computer software, hardware and firm ware in industries. It is needed to use CNC lathe machine to get more accurate dimensions and irregular shape. So, CNC machines are becoming more and more important in modernized industrialization. Developing and changing into semi-automatic control lathe machine, there are three required portions, namely, mechanical electronics and hydraulic. In this project we convert the convention lathes which have 5ft bed length in to the semi-automatic lathe. In mechanical side we replace the ball screw in place of lead screw for better accuracy and remove some unnecessary component like gears for providing space for motors. We add an extra plates or structure for installation of motors. Also provides a hydraulic circuit for coolant. In electronic side we used a servo/ stepper motor for both Z and X axis and provide controller for the efficient operation.

B Design and performance evaluation of a horizontal hydraulic honing attachment to lathe

The surface finish between two mating parts in an assembly has significant influence on the mechanical properties such as wear resistance, corrosion resistance, fatigue resistance and stress concentration. Honing is a finishing process, in which a tool called hone carries out a combined rotary and reciprocating motion while the work piece is stationary. Average roughness up to $0.1 \mu m$ can be attained. Most honing is done on internal cylindrical surface, such as automobile cylindrical walls. . The best surface roughness obtainable on this machine is $0.3 \mu m$.

C Investigation on Automation of Lathe Machine

Now days, products can be produced by modern technology, which uses computer software, hardware and firm ware in industries. It is needed to use CNC lathe machine to get more accurate dimensions and irregular shape. So, CNC machines are becoming more and more important in modernized industrialization. There are many conventional lathe machines in our country. To build a new modern developed country, it is required to convert these conventional lathe machines into semi-

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A Review on Gas Turbine Blade Failure and Preventive Techniques

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Abstract— With the increase in demand for power supply and more efficient turbojet engines, gas turbine designing is being pushed to its extremities. Turbomachines are becoming larger as compared to the machines of past decades. Due to increase in size, the cause and chances of failure have also increased. Gas turbine blade is the component which is exposed to extreme operating condition, thus experience different failure modes. Constant mechanical and thermal stresses act on different sections of blade. Newer super-alloys with enhanced metallurgical properties are being developed and tested to counter the stresses acting on the blades. Advance additive manufacturing techniques are used to produce next generation super-alloys. Failure due to mechanical and metallurgical anomalies are indirectly related to the high operational temperature and can be corrected up to a certain limit. Thus thermal protection is required for blades. Advance cooling techniques and coatings are being used for this purpose. Different literatures were combined to compile all the data analysed on blade failure and the preventive techniques being used.

Key Words— Gas turbine blades, Erosion, Fretting fatigue, Thermal stresses, Super-alloys, Hot corrosion, Film cooling, thermal barrier coating.

1. NOMENCLATURE

k_1 = Material constant

$f(\beta_i)$ = Empirical function of particle impact angle

V_{ti} = Tangent component of incoming particle velocity

V_{tr} = Rebound particle velocity

$f(V_{n_i})$ = Component of erosion due to normal component of velocity

E   = Erosion rate

K   = Von Karman constant

ε = Eddy diffusivity for momentum

l   = Mixing length

δ = Boundary layer thickness

P   = Row spacing of coolant holes

D   = Van Driest damping function

B_r = Blowing ratio

x   = Stream wise distance from point of injection

y   = dimensionless distance of first point off the blade surface

"Design and Analysis of wings of an Aerial Vehicle"

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Abstract— This paper details the design and analysis of a vehicle which is capable of both on-road operation and aerial travel. It was decided to design the vehicle in such a manner as to provide a feasible means of travel in regional centres and hence, reduce lengthy road travel or dependency on chartered flights. To design the airframe a classical approach was folloowed, whereby feasibility studies and statistical analysis were carried out on the development of existing flying cars and roadable aircraft. Within these analyses, two main design constraints were considered important for the commercial success of the vehicle; the handling qualities of each vehicle configuration and the ease of conversion between plane and car modes. As well as these constraints, the interior arrangement was also carefully considered. In order to address the handling issues, it was decided that the vehicle should be capable of conventional control while operating in both modes.

To fulfil the desired role as a substitute vehicle for regional travel, the total mission profile was considered as driving from a residence to a nearby airport before flying to a regional airstrip and driving to the final destination. The vehicle was capable of takeoff weight 1193 kg, maximum fuel weight 219kg, and can achieve a cruise speed of 77m/s and stall speed 28m/s at altitude 2500km, with a flight range of 980km, and rate of climb 755ft/min(3.83m/s) with available thrust 645kg.

Keywords— **Flying car, mission profile, takeoff weight, fuel weight, cruise, stall, range**

I.   INTRODUCTION

Since the invention of automobiles and aircraft, there has been a desire to combine the two vehicles in order to achieve the ultimate in adaptable travel: a flying car. The term "flying car" is often confused with "roadable aircraft", a term which means an aero plane capable of travelling short distances on the road between airports. The more correct definition of a flying car is a vehicle which is fully capable of travelling extended distances in the sky and on the road. It is the latter definition that was used to design the aircraft described in this paper. Several flying car designs have been successfully demonstrated over the last 70 years, and many current designers would have consumers believe current prototypes are just a few years away from production. While the novelty aspect of such a vehicle clearly attracts many interested parties, no design has been successful in the commercial market. The most common factors associated with the failure to make a flying car commercially attractive are the high product cost and a convenient conversion system between the two different modes of operation. Most consumers require a vehicle which is priced comparably to a light aircraft for personal use, and yet provide a conversion mechanism that is neither complex, time consuming nor labour heavy.

Earlier designs for flying cars, notably the Aerocar series by Aerocar International, attempted to overcome this last concern, by having the aircraft attachments (wings, tail, and propellers) completely separate and towed behind the car in a trailer, ready to be easily connected when ready for flight. Current proposed designs utilise jet engines to make the vehicle capable of Vertical or Short Takeoff and Landing (VTOL or STOL), and some even use large ducted fans to provide hovering abilities. Prior to undertaking an extensive design process, existing flying car concepts were compared, the different configurations were examined, and the most viable option was selected. The aerodynamic and stability qualities and overall performance of the vehicle was investigated, before a final design was proposed and supported by engineering drawings. This paper includes a description of manufacturing or testing of flying car at cruise condition.

Estimation of Vibration Response of a Bridge Column

8 Pages · Posted: 14 Jun 2019

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Date Written: February 24, 2019

Abstract

Moving vehicle on a bridge is considered as a moving load and the bridge structure is considered as a continuous beam. Due to the moving position of a vehicle on the bridge, the reaction on each column may be changed. This reaction is time variant for each column. The time-variant reaction is the major accountable factor in the generation of vibrations in a column. In spite of all the caution taken by the designers, bridges collapse without antecedence intimation. There are several reasons for the failure of such bridges. The probable reasons for bridge failure could be imperfect design, natural calamities or inappropriate use of material etc. Therefore, companies are seeking the perfect design considering the unanticipated load (due to natural calamities) as well as the vehicle load. In the design of such bridges, a designer examines many design parameters; one of them is induced vibrations in a column, which can also become a source of failure of a bridge. Hence, through this paper, an attempt is being made towards finding out a vibration response of columns of a bridge.

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Plastic: Historical Development and an Industrial Survey

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Abstract:-This paper presents an overview of historical development of plastic. Author has visited the plastic Molding Industry and speculated the probable areas where, one can improve the process by adopting the Filed Data Based Modeling Approach. These all prominent aspects are elaborated in forthcoming sections.

Index Terms: - Plastic Molding Industry, FDBM, History of plastic, Injection Molding

1. PANORAMA

If one looks back & thinks about material development process then he could observe that initially human being successfully made the use of a stone as a first material & that age was coined as Stone Age. Then comes Bronze Age, Iron Age & now the Plastic Age. Today plastic is having more influence in our life. The word "Plastic" obtained from the Greek language word "Plastikos"which means any stretchable substance that can be converted or changed into another shape or can be easily molded [7]. We can define plastic as, a polymer (synthetic or natural) of high molecular weight. Plasticity is that property of material by virtue of which those are able to deform without breaking. Now a days, plastics are becoming the most versatile materials and mostly used on a volume basis. Almost most of the products use by the society in daily lives contains plastics. Plastics have covered today's human lifestyle[3] & have a major contribution to all product areas because of some important properties like light in weight, high tensile strength, high impact strength, corrosion resistance property especially for chemicals & salt water applications. Application of plastics also covers utility in electrical insulation as well as sustainability for different temperature ranges [7].

2. HISTORY OF PLASTIC AND RELEVANT MOLDING MACHINE

One has to go back more than hundred years to know the history of plastics. Plastic had originated from rubber. Discovered in1851, ebonite, also known as hard rubber was the first thermosetting material [20]. In 1851 the English scientist Alexander Parkes detected the solid residue after the evaporation of the solvent of photographic collision was a tough elastic & impervious to water

[16].Alexander Parkes launched a new material named as Parkesine (1862). Parkesine·was obtained by liquefying cellulose nitrate in a minimum of solvent [16]. The mixture was then put on a heated rolling machine from which some of the solvent was then removed. While still in the plastic state the material was then shaped by dies or pressure. An American inventor named John Wesley Hyatt in 1868 developed a plastic material called Celluloid made by combining cellulose nitrate and camphor. Along with his brother Isaiah John Wesley patented the first injection molding machine in 1872[17].Later two German chemists Arthur Eichengrun and Theodore invented the first soluble forms of cellulose acetate in 1903, which was much less flammable than cellulose nitrate. It was available in powder form from which it was readily injection moulded.Arthur Eichengrun developed the first injection molding press in 1919.In1939, Arthur Eichengrun patented the injection molding of plasticized cellulose acetate [14].An American inventor James Watson Hendry, In 1946 built the first extrusion screw injection machine. The rotating screw made the injection speed easier to control and it helped to produce higher quality products. The products like polyethylene, polystyrene, and other materials that had been more expensive in the past, were starting to be produced more cheaply. They also started to replace not only other plastics, but also more traditional materials like wood, metal, leather, and glass [15]. W.H. Willert developed the reciprocating injection molding machine in 1956 [16]. In his machine, the screw moves backwards and forwards during the mold cycle. The screw rotation will stop once the proper mixing will take place. The screw injects the material inside the mould cavity. Many useful new thermoplastics like high-density polyethylenes and polypropylene get

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Estimation of Vibration Response of a Bridge Column

Proceedings of International Conference on Sustainable Computing in Science, Technology and Management (SUSCOM), Amity University Rajasthan, Jaipur - India, February 26-28, 2019

8 Pages · Posted: 14 Jun 2019

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Date Written: February 24, 2019

Abstract

Moving vehicle on a bridge is considered as a moving load and the bridge structure is considered as a continuous beam. Due to the moving position of a vehicle on the bridge, the reaction on each column may be changed. This reaction is time variant for each column. The time-variant reaction is the major accountable factor in the generation of vibrations in a column. In spite of all the caution taken by the designers, bridges collapse without antecedence intimation. There are several reasons for the failure of such bridges. The probable reasons for bridge failure could be imperfect design, natural calamities or inappropriate use of material etc. Therefore, companies are seeking the perfect design considering the unanticipated load (due to natural calamities) as well as the vehicle load. In the design of such bridges, a designer examines many design parameters; one of them is induced vibrations in a column, which can also become a source of failure of a bridge. Hence, through this paper, an attempt is being made towards finding out a vibration response of columns of a bridge.

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AN ANALYTICAL STUDY OF CONTACT STRESS AND CONTACT ZONE

ANALYSIS OF CYLINDRICAL (ROLLER) & SPHERICAL

(BALL) BEARINGS IN EPICYCLOID CONDITION

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ABSTRACT

This paper reports Contact Stress and Contact Zone Analysis of cylindrical (Roller) & Spherical (Ball) Bearings using M. F. Spotts Analytical Equation for epicycloid condition. The different combinations of ratios of its outer radius and inner radius i.e. (R_2, R_1) and the elasticity of the material E_1, E_2 have been considered to investigate the compressive stresses (P_o), and the contact zone (a) on the surfaces of the ball & Roller bearing i.e. Analytical method is applied for the analysis of both spherical and cylindrical type of Ball Bearing Cavity. The results are compared between both type of bearings and final interpretation has been made.

KEYWORDS: Contact Stress, Contact Zone, Analytical Method & Ball Bearing

Original Article

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Original Article

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Sustainable Recycling of Insoluble Rust Waste for the Synthesis of Iron-Containing Perovskite-Type Catalysts

Francesca Deganello,*,[†] Manisha Joshi,[‡] Leonarda F. Liotta,[†] Valeria La Parola,[†] Giuseppe Marcì,[§] and Giuseppe Pantaleo[†]
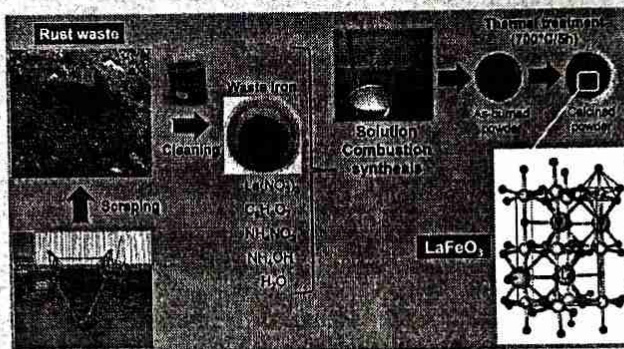
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S Supporting Information

ABSTRACT: Insoluble rust waste from the scraping of rusted iron-containing materials represents a cheap, eco-friendly, and available source of iron. $LaFeO_3$ perovskite-type powders were successfully prepared by solution combustion synthesis using rust waste from an electricity transmission tower manufacturer. Solution combustion synthesis enabled introduction of this insoluble iron precursor directly into the final product, bypassing complex extraction procedures. Catalytic activity in the propylene oxidation of the waste-derived $LaFeO_3$ with stoichiometric Fe/La ratio was almost identical to the commercial iron nitrate-derived $LaFeO_3$, thus demonstrating the viability of this recycling solution. The amount of waste iron precursor was varied and its effect on the powder properties was investigated. A lesser stoichiometric amount of precursor produced a $LaFeO_3-La_2O_3$ binary system, whereas a higher stoichiometric amount led to a $LaFeO_3-Fe_2O_3$ binary system. Catalytic activity of iron-rich compositions in the propylene oxidation was only slightly lower than the stoichiometric one, whereas iron-poor compositions were much less active. This eco-friendly methodology can be easily extended to other iron perovskites with different chemical compositions and to other iron-containing compounds.

INTRODUCTION

The iron element is present in most of the perovskite-type catalyst formulations for application in pollution control, solar conversion, oxygen separation, electrochemical production, and storage of energy and sensoristics.[1−5] The presence of iron at B-site of the ABO_3 perovskite structure ensures very good reactivity toward oxygen and oxygenated compounds. Iron perovskites are usually prepared from a commercial iron nitrate precursor,[2,3] but sustainable methodologies to obtain iron-containing catalysts from waste-derived iron-rich sources are highly desirable, according to the concepts of circular economy promoted by the European Commission.[6] Most of the experimental procedures proposed in the literature for iron waste recycling deal with the synthesis of other materials and not perovskites. For example, waste ferrous sulfate from titanium dioxide industry,[7] heavy tonnage iron-removal sludge waste,[8] oily cold rolling mill sludge, and ashes of scum from anaerobic treatment of municipal sewage[9] have been used as inorganic precursors for preparing iron-based pigments or hematite nanoparticles. Recently, rusted iron coil and stainless steel wires have also been used for preparing hematite film with

water oxidation and oxygen evolution activity.[10] Apparently, only in the works by Pullar et al.[11] and Dufour et al.[12] a perovskite-type barium hexaferrite magnetic material has been produced from dried steel wiredrawing sludge waste as iron source. Waste iron, which is produced from the scraping of rusted iron-containing materials, can also be used as an iron source for the synthesis of nanomaterials with high catalytic activity and selectivity[13−15] and represents a cheap, eco-friendly, and inexhaustible source of iron. In fact, if rust has already been formed, rust scraping is necessary to remove rust from the surface, preventing the iron objects from further damage. This rust must be disposed of as waste or dismissed as scrap iron at very low rates.

The aim of this work is to evaluate the possibility of using rust waste from scraping as a source of iron for the synthesis of an iron perovskite such as $LaFeO_3$ nanomaterial. This iron-based compound was selected as a proof-of-concept material

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