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Criteria-3

Research, Innovations and Extension

Sub Criteria 3.3

Research Publications and Awards

3.3.2: Number of research papers per teachers in the Journals notified on UGC website during the last five years

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3.3.2 Number of research papers per teachers in the Journals notified on UGC website during the last five years

LIST OF JOURNAL PAPERS AND PROOF

S.No	Title of paper	Name of the author/s	Department of the teacher	Name of journal	Year of publication	Page No.
1	Universal dispersion curves of a planar waveguide with an exponential graded-index guiding layer and a nonlinear cladding	Dr. R Udaiyakumar	ECE	Results in Physics	2021	14
2	Upgrading the Quality of Power Using Hybrid Controller Based PFC Converter Fed SBLDC Motor Drive	Arun Kumar U	EEE	Interciencia	2021	15
3	Combined phase balancing and reconfiguration for unbalanced distribution system optimization through hybrid fuzzy MFOA	Mahendran. G	EEE	Journal of Ambient Intelligence and Humanized Computing	2021	16
4	Upgrading the Quality of Power Using TVSS Device and PFC Converter Fed SBLDC Motor	Arun Kumar U	EEE	Arabian Journal for Science and Engineering	2021	17
5	A Bridgeless Landsman Converter Fed Sensorless Brushless DC Motor Drive for Upgrading quality of Power	Arun Kumar U	EEE	Solid state Technology	2021	18
6	Liquid phase hydrodeoxygenation	Dr. V.L.Mangesh	MECH	Journal of Solid State Chemistry	2021	19

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7	Performance, Environment and Cost-benefit Analysis of a Split Air Conditioning Unit Using HC-290 and HCFC-22	Dr. A. Lalitha Saravanan	MECH	Environmental Progress & Sustainable Energy	2021	20
8	Upgrading the quality of power using bridgeless Cuk Converter fed SBLDC Drive	Arun Kumar U	EEE	Solid state Technology	2020	21
9	Design And Analysis of MPPT Based Buck Boost Converter for Solar Photovoltaic System	Dr.B.Vaikundaselvan	EEE	International Journal of Electrical Engineering and Technology	2020	22
10	Design and Implementation of FPGA-Based Grid-Connected Impedance-Source Inverter	B. Vaikundaselvan	EEE	Journal of The Institution of Engineers (India): Series B	2020	23
11	Design and Implementation of FPGA-Based Grid-Connected Impedance-Source Inverter	T. Sivakumar	EEE	Journal of The Institution of Engineers (India): Series B	2020	24
12	PWM Strategy for Three Phase Voltage Source Inverter With Minimum Harmonic Distortion	Dr.B.Vaikundaselvan	EEE	International Journal of Electrical Engineering and Technology	2020	25
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15	Smart Digital Water Flow Surveillance System Using IOT	Dr.M.Varatharaj	ECE	Journal of Emerging Technologies and Innovative Research (JETIR)	2020	28
16	Point of Interest Recommendation Engine	T Sakthi shree	CSE	International Journal of Recent Trends in Engineering & Research	2020	29
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18	Exploring refractive index ultra-compact nano sensor using photonic crystal resonant cavities	Dr. R Udaiyakumar	ECE	American Scientific Publishers: Journal of Computational and Theoretical Nanoscience	2020	31
19	Conflagration and logging detection	Dr. Banumathi.P	CSE	International Journal of Advanced Scientific Research and Management	2020	32
20	Conflagration and logging detection	Ms.Gokilapriya.P	ECE	International Journal of Advanced Scientific Research and Management	2020	33

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23	Opulent Futuristic Smart Sensing Garden	M. Varatharaj	ECE	International Journal of Computer Sciences and Engineering	2020	36
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37	Influence of Organic Additive Benzene Sulfamide on the Magnetic Behavior of Electrodeposited CoMnP Thin Film Alloys	K V Kannan Nithin	Physics	Sensor Letters: Americian Scientific Publisher	2019	50
38	Influence of Organic Additive Benzene Sulfonic Acid on the Magnetic Behavior of Electrodeposited COMNP Thin Film Alloys	K V Kannan Nithin	Physics	International Journal of Innovative Technology and Exploring Engineering (IJITEE)	2019	51
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40	Idle Vehicle Detection and Traffic Symbol Analysis Using Artificial Intelligence and IOT	T.K.P RajaGopal	CSE	International Research Journal of Multidisciplinary Technovation	2019	53

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47	Mathematical modeling and analysis of elastic waves in a thermo piezoelectric multilayered rotating composite rod with LEMV/CFRP interface	S Mahesh	MATHS	Technische Mechanik	2019	60
48	An optimal low power digital controller for portable	N. Vijayalakshmi	ECE	Journal of Renewable and Sustainable	2018	61

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70	FPGA Based BI-CSC Converter-Fed BLDC Motor Drive with Power Factor Correction MR	Dr.B.Vaikundaselvan	EEE	International Journal For Research In Electronics & Electrical Engineering	2017	83
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89	Autonomous Control of Interlinking Converter with Energy Storage in Hybrid AC-DC Microgrid	B. Vaikundaselvan	EEE	International Journal for Scientific Research & Development	2016	102
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Universal dispersion curves of a planar waveguide with an exponential graded-index guiding layer and a nonlinear cladding

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ARTICLE INFO

Keywords:
Slab waveguide
Exponential graded index
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ABSTRACT

A planar waveguide consisting of three layers is considered. The guiding layer is assumed of exponentially graded index of refraction. The cover layer is a nonlinear material of Kerr-type. The refractive index distribution of the film layer changes as an exponential function from the guiding layer to the substrate. The solutions of Helmholtz equation are found. They are written in terms of three parameters a, b and V. The solutions in the guiding layer and substrate are found as Bessel functions of order $V\sqrt{b}$. The characteristic equation is derived and the dispersion curves are plotted and analyzed. A set of attracting features are found such as there is no cut-off thickness corresponding to a symmetric waveguide structure. The b-values do not exceed unity. This means the dispersion curves refer to guided modes.

Introduction

For the past decades, graded index waveguide [1–3] achieved greater attention as it is more practical than step-index. The properties of both step index and graded index waveguides are generally similar to each other except some delicate changes. A waveguide with graded index guiding layer is the composition of three layers whose index profile has a region with index n_s, a guiding layer with index n_f and a cladding with an index n_c. In general, waveguides with graded index profile, the substrate and guiding layers merge smoothly as a continuous area which indicates that the index in both layers is merged. It is represented by one function $n(x)$. The index of refraction $n(x)$ alters continuously from n_f to n_s. In waveguides like lithium tantalate and in-diffused lithium niobate, the index distribution has a smooth variation from that of the film to that of the substrate. It is approximated as an exponential function. To investigate a graded index waveguide with a random profile, it is required to employ numerical techniques. Sometimes the techniques of approximation may be employed such as WKB. Approximate dispersion relation can be deduced in these cases.

There has been considerable interest in the waveguide analysis that comprises nonlinear media of intensity-dependent indices. Waves guided by these structures were investigated [4–7]. A large variety of optical devices are based on these waveguides. Various solutions of wave equation characterized by nonlinear index were proposed. Formulating a theory was proposed for the reflection and refraction of electromagnetic waves at the boundary between a linear and nonlinear media [8]. It was shown that as the wave angle of incidence is amended, hysteresis hops are noted from the transmission regime to the regime of total internal reflection and vice versa. When the nonlinearity is small, the closeness of the linear index of the nonlinear material and that of the linear material is the crucial condition required for hysteresis consequence presence. Such studies, which handled reflection and refraction of electromagnetic waves at an interface between nonlinear and linear materials, stimulated additional theoretical and experimental research on electromagnetic waves both refracted and guided by these interfaces [9]. Researchers have found numerous analytical solutions for the

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Upgrading the Quality of Power Using Hybrid Controller Based PFC Converter Fed SBLDC Motor Drive

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Abstract - The globe has now come to a point where it is unmanageable for humans to do any work without power. Therefore, the main motive of this paper is to ameliorate the quality of power. So, to enhance the quality of power, unification of PF, and lowering the harmonic distortion is required. This paper presents the improvement of power quality using a power factor correction regulator feeding a brushless drive with sensorless control. The converter configurations designed used here operates in intermittent conduction mode which acts as an inherant part to improve the quality of power. A brushless drive fed using the power factor correction converter is controlled using hysteresis comparator technique which reduces the phase lag of back emf and improves the consistency of the system. Moreover usage of fuzzy logic improves the robustness of the system and enhances the consistency. A comparative analysis is done among the various converters with sensorless control of BLDC and the converter with better performance is analyzed based on the PQ parameters. Also, usage of bridgeless configuration of converter reduces the switching losses as the diode rectifier is partially eliminated. The designed system is validated through experimental results with wide range of control speeds and voltages. The obtained quality of power is under the acceptable limits of IEEE and IEC standards.

Keywords: Improved Power Quality; Sensorless Brushless DC (SBLDC) motor; Power Factor Correction (PFC), Hybrid Controller (Fuzzy+PI)

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ORIGINAL RESEARCH

Combined phase balancing and reconfiguration for unbalanced distribution system optimization through hybrid fuzzy-MFOA

G. Mahendran[1] · C. Govindaraju[2]

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Abstract
The phase balance and reconfiguration of the power distribution system is a dynamic analysis to improve and manage the radial power distribution system. Power loss analysis in the distribution system is mainly central, considering the point of view of money. In order to reduce power loss, different technologies are excluded in reconstruction, capacitor layout and phase balance. In addition to these three methods, in unevenness in the distribution system, the phase balance is considered one of three dynamic processes all of those above. Unbalanced feeders are dangerous for incremental power loss and excessive burden conditions; however, they affect quality and cost. A severely uneven circuit can convey an unsafe voltage drop in the intense phase. A positive feeder system is arranged to be load-dependent, recording balanced feed, the desire to improve the load and unbalanced load errors will begin feeder imbalance. For the equilibrium phase feeder, the exchange is a quick and convincing way. This paper proposes a problem of adding phase balance and reconfiguration to try to assist the hybrid fuzzy and Moth flame optimization algorithm (MFOA) to deal with the uneven distribution system. The verification of the estimative program is completed with two standard evaluations, and the work approves the simulation results.

Keywords Distribution system · Fuzzy · Moth-flame optimization · Phase balancing · Reconfiguration · Unbalanced feeder

1 Introduction

1.1 Background of the study

The optimization of the power distribution system is because the presentation of the system greatly improves the basics. The well-known techniques, namely feeder reconfiguration, capacitor placement, Distributed Generator (DG) placement and phase exchange, can reduce power loss and reduce unbalanced loads at the feeder.

The reconfiguration of the power distribution system is a process, which changes the feeder interconnection planning in the power distribution system by changing the handle opening/closing condition (Ding and Loparo 2016; Pegado et al. 2019). DG and capacitor positions (Abdelsamad et al. 2015; Pereira et al. 2016; El-Ela et al. 2018; Mehmood et al. 2018; Gangwar et al. 2019) are the proof and optimization estimation mechanism of the perfect zone. The DG/capacitor layout and feeder reconfiguration have been swapped in the previous schedule for a significant expansion timeline and were generally ignored by general inspections. Due to the openness of the set number of segment switches, feeder reconfiguration is challenging. The principle of phase change encountered is an unbalanced feeder system. Phase swapping is a direct and alternative method of phase change. To improve the program's use, it is necessary to be exchanged in the same three stages spread the load. Phase exchange has not yet developed its reasonable idea, due to inconsistencies in the feeder system, to assess the problem and internal and external, regardless of the stage of irregular effect. Most of the problems to extend distribution systems exchange has not been marked investigation.

1.2 Literature review

In Dolloff (1996), a phase balance machine was suggested, which records phase adjustment changes in the feeder. A heuristic backtracking search algorithm is described in

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RESEARCH ARTICLE-COMPUTER ENGINEERING AND COMPUTER SCIENCE

Upgrading the Quality of Power Using TVSS Device and PFC Converter Fed SBLDC Motor

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Received: 13 November 2020 / Accepted: 24 March 2021

Abstract
This globe has now come to a point where it is unmanageable for humans to do any work without power. Therefore, the main motive of this paper is to ameliorate the status of power. So to boost the condition of power, there are three predominant processes. So this proposed procedure performs functions like repressing the transitory voltage surge, get unification of PF, and lowering the harmonic distortion. This is because power changes, whether high or low, present a complication with electrical equipment. Therefore, transient voltage surge suppressors are utilized in the AC power line to stay the power changes usual. Then, for the motive of unifying the energy factor and lessening the harmonic distortion, this paper utilizes the more efficient BLDC Motor fed through bridgeless converter configuration. Because utilizing a brushless motor, performs functions extremely efficiently such as longevity, increasing reliability and reduced noise. However, since it is exceeding principle to command the speed of the motor, the Sensorless form is utilized here. The intention of utilizing this is the spot of the rotor is extremely pivotal to handle the momentum of the motor and it's also hugely difficult to identify. Therefore, this proposed mechanism for performing these functions utilizes the Sensorless BLDC Motor and to reach power factor correction (PFC) bridgeless converter topologies are used. A comparitive analysis is done among the various converters and the best converter is analyzed based on the PQ parameters. The obtained quality of power is under the acceptable limits of IEEE and IEC standards.

Keywords Improved power quality · TVSS device · Sensorless brushless DC (SBLDC) motor · Power factor correction (PFC)

1 Introduction

Nowadays brushless motors are utilized additional often than brushed motors. The reason is that brushless motors are very good performing at the low sound noise and power efficiency improvements. Usually brushless motors use one or more sensors. With this function, the sensor is wired and the cost of operating it is high. Also, sensors cannot be used in rotor existing applications in closed housing. In applications where the motor is submerged in a fluid such as a compressor, or some pumps, must keep the number of electrical inputs to a minimum. So in terms of technology and cost reason, Sensorless BLDC Motor is considered as a major requirement. This Sensorless BLDC Motor gives very high performance, at very low cost. As a result of high performance, excessive torque to inertia ratio, excessive power density, low preservation need and extensive variety of speed manipulate; brushless DC (BLDC) motors are extensively favoured in lots of minimal and medium energy exeercises. It's far used in many house equipments of Gadget like fans, air conditioners, water pumps, Refrigerators, washing machines etc.It also finds applications in lots of commercial gear, medical equipments, Heating, air flow and air con, robotics and Particular movement control structures [1–3].

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A Bridgeless Landsman Converter Fed Sensorless Brushless DC Motor Drive For Upgrading The Quality of Power

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Abstract— This paper presents the upgradation of quality of power using a bridgeless landsman converter fed SBLDC motor drive. The designed regulator operates in intermittent inductor current mode and used to attain a close to unity power factor at supply ends. The speed of the SBLDC drive is maintained using a sensorless technique where the BLDC is fed through a bridgeless regulator. Moreover, usage of BL regulator provides minimal conduction losses as the diode rectifier is eliminated partially. The proposed design shows a substantial improvement in the efficiency compared with the existing system. The achieved quality of power indices that the limits are under various international standards like IEC and IEEE.

Keywords- *Intermittent Inductor Current Mode, SBLDC Motor Drive, Bridgeless (BL) Landsman (LM) Regulator*

I. INTRODUCTION

Brushless drives have acquired significance in most recent decades because of power quality upgradation and wide performance compared with traditional drive systems[9]. The features of high effectiveness, high unwavering quality, reduced electromagnetic difficulties and astounding process execution over wide scope of speed control have made this drive more popular[3]. The BLDC drive is fit for many low and medium power applications varying from computer hard drives, fuel pumps, e vehicles, compressors and dryers.

A diode rectifier feeding the voltage source inverter via DC link capacitor makes the drive to draw high harmonic current from the mains resulting in reduced quality of power[7]. To avoid these blemishes, power factor regulators are used. Few many designs are derived in the literature surveys with less number of components and reduced losses. Usually, a boost converter approach will be used which includes current multiplier approach requiring three sensors and high with high switching stress. The front end cuk and sepic converter configurations have been designed but a higher cost. BL SEPIC converter is designed with higher inductance and huge cost.

Bridgeless configurations have gained importance recently due to minimal switching losses due to partial avoiding of uncontrolled rectifier[5]. Figure 1 shows the basic stepup converter fed BLDC drive. In

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Liquid phase hydrodeoxygenation of furfural over laponite supported NiPMoS nanocatalyst: Effect of phosphorus addition and laponite support

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ABSTRACT

Unsupported and laponite supported NiPMoS catalysts were prepared under the hydrothermal method and investigated for liquid-phase hydrodeoxygenation of furfural in a high-pressure batch reactor at 423 K – 463 K under 20 bar H_2 pressure. The reaction significantly produced 94% of furfural conversion with 75% yield of 2-MF on NiPMoS catalyst whereas, NiPMoS/Lap catalyst exhibited 28% of 2-MF yield with complete conversion at 463 K under 20 bar H_2 pressure in toluene solvent. The influence of process parameters such as reaction temperature, reactant volume, catalyst compositions, and hydrogen pressure on furfural conversion and product yield was investigated in detail. The high reactivity and synergetic effect of the NiPMoS catalyst are due to added phosphorus, which has a profound influence on the structure of the catalyst, thereby increasing surface acidity, basicity, hydrogen consumption, and a number of MoS_2 fringes and the dispersion of MoS_2 on the surface of the support. The catalysts were characterized based on HRTEM, H_2, CO_2, and NH_3 TPD, FT-IR, FT-Raman, DRS UV-Vis, XRD, N_2-physisorption, and TGA. Recyclability, N_2-physisorption, and XRD results confirm the stability and practical applicability of the catalyst for industrial applications.

1. Introduction

In the current decade, the scarcity of non-renewable fossil fuel has harnessed to find renewable and sustainable resources to solve the rapid increase in energy demand related to petrochemical products. In addition to that, from the point of eco-friendly perspective, the constant consumption of fossil fuel would be responsible for CO_2 emission which results in air pollution and global warming. With consideration of these facts, much attention has been paid to re-balancing the carbon cycle. Biomass seems to be considered an alternate and naturally available material for future energy production and petrochemical economics. Biomass can be converted into value-added chemicals and petrochemical intermediate compounds through pyrolysis, high-pressure liquefaction and hydrogenation of bio oil into through catalytic hydrogenation and hydrodeoxygenation [1–3]. In addition to that, the carbon emission from the biomass derived fuel compounds can be kept constant for producing carbon-neutral fuel that would be a potential alternative for fossil fuels.

In recent years, biomass into fine chemicals *via* catalytic hydrogenation and its derived biofuel is much more attractive because of an increase in the demand for energy to produce sustainable fuel chemicals. As biomass contains a significant weight percentage of oxygenated unsaturated compounds, the catalytic conversion of biomass-derived oxygenates through hydrodeoxygenation (HDO) is considered to be important for the fundamental understanding of the process [4–6]. Furfural (FFR) is an important heterocyclic organic compound of lignocellulosic biomass, considered a platform chemical [7]. Catalytic conversion of this compound can be utilized to generate various kinds of fuel-grade hydrocarbons and chemicals such as, for instance, 2-methyl furan, furfuryl alcohol, and tetrahydrofurfuryl alcohol [8,9]. It has been reported that catalytic conversion of furfural into alicyclic five-membered compounds was achieved on Pt and Pd supported catalysts [10,11]. The reaction involved in obtaining those compounds either through selective catalytic hydrogenation of FFR or C-O bond breaking by catalytic cracking over a suitable hydrotreating catalyst [12].

These compounds can be used as a potential fuel/fuel additive or solvent for the production of resins [7,13]. tetrahydrofurfuryl alcohol is extensively applied as an eco-friendly solvent, associated with the following reasons, significantly less toxic, and it could be degradable and stable compared to unsaturated furan compounds. Furfural derivative

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ENVIRONMENTAL PROGRESS & SUSTAINABLE ENERGY

Performance, environment, and cost-benefit analysis of a split air conditioning unit using HC-290 and HCFC-22

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Abstract

A widely used hydrochlorofluorocarbon (HCFC) refrigerant HCFC-22 in the split air conditioner (AC) is being phased out in all countries under the Montreal Protocol. Propane (HC-290) is a favorable substitute for HCFC-22. The performance, environment impact and cost-benefit analysis of a split AC unit operated with HCFC-22 and HC-290 has been carried out experimentally under different test conditions prescribed by IS 1391. The results showed that the variation in system performance was more significant for HCFC-22 than for that of HC-290 while varying the refrigerant charge. The experienced optimum charges that represent the maximum coefficient of performance (COP) was varied with the working environment and it was realized that, generally the optimum charge for HC-290 was 50% lesser than that of HCFC-22. The COP of the AC unit with HC-290 was observed to be 5% more than that of HCFC-22. However, the system capacity diminished by 7.8%. The operation of a split AC unit with HC-290 produced up to 15.9% lesser CO_2 emission than that of HCFC-22 under all the test conditions. The use of HC-290 in an existing HCFC-22 split AC system can save up to 12.22% of the life time total cost. Finally, it was inferred that the replacement of HCFC-22 with HC-290 in the split AC unit showed dominance in all aspects such as performance, emission, and life time total cost.

KEYWORDS
COP, global warming potential, HC-290, HCFC-22, total equivalent warming impact

1 | INTRODUCTION

Hydrochlorofluorocarbon (HCFC) refrigerant HCFC-22 has been widely used as a refrigerant in heat pump and air conditioning (AC) applications. The use of HCFCs is restricted due to environmental protocols.[1-2] The Montreal protocol agendas have been progressive to phase out the manufacturing and practicing of HCFCs by 2020 and 2030 by the developed and developing countries (India), respectively.[3-4] In India, about 6.7 million AC units were sold in 2018 and it is expected to reach 124 million by 2030. Approximately 145 GW of electricity is needed for its operation. Also, most of the split ACs in India use HCFC-22 (about 70%), and this results in more

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Upgrading The Quality Of Power Using Bridgeless Cuk Converter

Fed SBLDC Drive

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***Abstract*—**This paper develops a BL Ćuk converter-fed SBLDC drive for an air conditioning usability. A new technique to manage the speed of SBLDC motor is proposed with the aid of controlling the potential at DC bus the usage of a one voltage sensor. The proposed drive utilises a BL Ćuk converter working in Intermittent inductor current mode (IICM) for the power aspect correction and advanced energy excellence at the AC mains for a extensive variety of speed manipulation. The speed of the SBLDC drive is maintained using a sensorless technique where the BLDC is fed through a bridgeless regulator. The BL Ćuk regulator working in a IICM offers an inherent PAC and calls for a simple voltage follower technique for the voltage control. The BL topology is designed for acquiring the low conduction losses and need of low size of warmth sink for the devices. The proposed system is designed and its overall performance is simulated for an air conditioning system to function over a huge form of speed manage with near energy factor at AC mains

Keywords- *Intermittent Inductor Current Mode, SBLDC Drive (Sensorless Brushless Drive), (BL) Ćuk Regulator, Power Aspect Correction (PAC), Uncontrolled Bridge Rectifier (UBR)*

I. INTRODUCTION

As a result of high performance, excessive torque to inertia ratio, excessive power density, low preservation need and extensive variety of speed manipulate; brushless DC (BLDC) motors are extensively favoured in lots of minimal and medium energy exeercises. It's far used in many house equipments of Gadget like fans, air conditioners, water pumps, Refrigerators, washing machines etc [1-3].It also finds applications in lots of commercial gear, medical equipments, Heating, air flow and air con, robotics and Particular movement control structures [1-3]. This machine has a 3 segment windings on the stator and permanent magnet within the rotor. As the call suggests, it has no brushes for the commutation moreover an electronic commutation is utilised in which hall transducers are utilized for the position analyzing to arise the desired commutation situation using a potential supply inverter (VSI). Hence, it is also referred to as electronically commutated drive[3]. Owing to this, majority problems related to the mechanical commutator which include sparking, put on and tear of brushes and commutator meeting, noise troubles and electromagnetic intervention are eliminated[3].

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DESIGN AND ANALYSIS OF MPPT BASED BUCK BOOST CONVERTER FOR SOLAR PHOTOVOLTAIC SYSTEM

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ABSTRACT

Maximum power point trackers are so important to improve the efficiency of photovoltaic systems. Many methods have been proposed to achieve the maximum power that the PV modules are capable of producing under different atmospheric conditions. This paper proposed a Perturb and Observe based Maximum Power Point Tracking (MPPT) algorithm for solar system. The solar panel is simulated and analyzed in MATLAB/SIMULINK. Photovoltaic system is connected to a DC-DC Buck-boost converter. The Solar panel can produce maximum power at a certain operating point called Maximum Power Point (MPP).To achieve maximum power and to get maximum efficiency, the whole system must operate at that Maximum Power point. Maximum power point of PV panel keeps same on changing with changing solar irradiance and temperature of cell. Then to obtain maximum power from a PV system, MPPT algorithms are implemented. So that, P & O based MPPT is developed and Simulation results show the effective of the P&O based controller to produce more stable power.

Keywords: DC-DC Boost Converter, Maximum Power Point Tracking, PV System, P&O Method, Solar Panel.

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ORIGINAL CONTRIBUTION

Design and Implementation of FPGA-Based Grid-Connected Impedance-Source Inverter

B. Vaikundaselvan[1] · T. Sivakumar[1] · S. Sonia[1]

Received: 18 April 2019 / Accepted: 5 February 2020

Abstract In recent time, Z-source inverter (ZSI) is designed by a new power adapting concept mainly for renewable energy application and other industrial applications. ZSI eliminates the drawbacks of the traditional inverter and provides high efficiency, and it also contains the buck and boost operation in it. This paper presents the grid-connected Z-source inverter and LZ-source inverter by controlling the shoot-through states of an impedance-source neutral-point-clamped inverter using a space vector modulation technique. Normally, the grid-side source contains harmonics. The main aim of this paper is to design, model and experimentally study the Z-source and LZ-source grid-connected inverters by using the MATLAB simulation. By using the control algorithm, the grid-side total harmonic distortion (THD) is controlled and maintains the IEEE standard level. The control algorithms make this inverter's outputs purely sinusoidal. The THD values of the Z-source and LZ-source grid-connected inverters are compared to find the efficient impedance-source inverter. The proposed control technique hardware is designed, and the experimental results are compared with the simulation results.

Keywords ZSI · L-ZSI · FPGA · Grid · THD

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Introduction

Recently, the distributed generation (DG) is progressively critical to get an increasingly productive power exchange [1, 2]. The profoundly utilized distribution generation frameworks are sunlight-based boards, windmills and thermal power plants. Mainly, the energy is received from these resources and further connected with the inverter/converter circuit, which is further fed to the grid side for carrying the transmission of active and reactive power. The major disadvantages are: It can infuse or it will ingest the receptive power at times and the vast majority of the frameworks are working unity power factor. Another downside of the conveyance age framework is the power will not consistently go to the grid on account of certain variables such as the absence of intensity request and more utilization.

Many forms of new and renewable energy are not natural 50 Hz or 60 Hz sources, and the question arises on the means of incorporating them into a standard electricity grid [3]. Power systems are experiencing a quick development with reference to distributed generation [4]. A number of factors arise due to this trend including monetary benefits, environmental concerns, consistency needs and tax incentives. Different power production technologies including microturbines, fuel cells and renewable sources such as solar and wind powers are described by [5, 6]. This list will certainly develop with the advent of cap hybrid electric vehicles and well-organized energy storage to mention just two technologies that draw a special attention [7, 8]. Miniature generators have been spread throughout the power system. Generally, these sources are not coordinated with the grid power supply, but rather put into service when the primary supply is intermittent. Furthermore, they tend not to be organized with each other,

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Keywords ZSI · L-ZSI · FPGA · Grid · THD

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PWM STRATEGY FOR THREE PHASE VOLTAGE SOURCE INVERTER WITH MINIMUM HARMONIC DISTORTION

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ABSTRACT

In this paper, comparison between two different Pulse Width Modulation (PWM) techniques employed for three phase Voltage Source Inverter (VSI) is discussed. A suitable PWM technique is employed to obtain the required output voltage in the line side of the inverter. The PWM generation techniques used in this paper mainly based on Space Vector based Pulse Width Modulation (SVPWM) and Modified Space Vector based Pulse Width Modulation (MSVPWM). MSVPWM method involves the comparison of the three phase reference modulating signals with a common triangular carrier wave to generate the pulses for the three phases. Whereas, in SVPWM method, a revolving reference voltage vector is provided as voltage reference instead of three phase modulating waves. This paper analyses the two Pulse Width Modulation techniques for three phase VSI and the current THD is maintained at the level of below 5%. The two Pulse Width Modulation techniques for three phase Voltage source inverter are compared by the current THD values to select the method with lower THD values.

Keywords: Pulse Width Modulation, Voltage Source Inverter, Total Harmonic Distortion, SVPWM, MSVPWM.

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POWER FACTOR CORRECTION BY BRIDGELESS BUCK BOOST CONVERTER

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ABSTRACT

In current Scenario, efficiency and economic are the major concerns in designing and developing low-power applications. The aim of the paper is to design a Bridge Less Power Factor Corrected (BLPFC) buck boost converter for low power applications. The diode bridge is eliminating using bridgeless configuration thus reducing the conduction losses associate with in it. A BLPFC buck boost converter is design to operate in Discontinuous Current Mode (DCM) to provide a better Power Factor Correction (PFC) at AC mains. The PI controller design will be used to reduce the harmonics present in the system and to maintain the unity power factor at different voltages. This drive is to compare with the different input voltages and shows satisfactory performance. The performance of the system is to be simulated using MATLAB/Simulink. The experimental output values will be tabulated and the system is maintaining unity power factor at various voltages (90V, 100V, 125V).

Keywords: Power factor correction, Bridge Less Power Factor Corrected (BLPFC), Buck boost converter, PI Controller, discontinuous current mode.

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SMART DIGITAL WATER FLOW SURVEILLANCE SYSTEM USING IOT

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Abstract: *The idea of a Smart digital water flow surveillance system is for the Smart buildings, Colleges, Hospitals, Industries, and Homes. In our day to day life, we see our cities facing many problems with water wastage, which leads to water scarcity and water pollution due to the overflow of water along roadsides. The main process is to save the water and monitor the usage of water. The wastage of water will also affect the environment and can cause water pollution due to the addition of oils and pesticides around the land. The most important need for having a smart way of life is by saving water. The Smart digital water flow surveillance system is a new idea to save water. It can send information through IoT to an android application of the user about the filling and empty water tank and it can also detect the water flow from the public water line. This system also used to measure the usage of water by the user using the water flow meter. Every process of the system is updated in an android application for user convenience.*

Index Terms **- PIC16F877A, Moisture sensor, Floating sensor, Wi-Fi module, Water flow sensor, Solenoid valve.**

I.INTRODUCTION

The world is getting automated more day by day and hence an eco-friendly technique is essentially required. Water management is the most required process around the world. Water usage can be estimated by monitoring and measuring the water utilized by a person. So far, the technology is much developed but there is a need for innovation. The concept provides a plan for reducing the wastage of water[4]. Nowadays, most of the industries are given rebirth with automation but, the local is still backward in automation. It is also equally important to have a low cost, robust and simple system to monitor the water consumption in the residence using an automated system.

The implementation of concept may differ among countries; insufficient water is a major issue among most developing nations. Since, less water usage is always welcomed wide over the world. Water management has an important commitment to ensure water consumption awareness and to avail of the measurement to the consumers. Mostly, the usage is unlimited due to the lack of measurement. In some cases, consumer involvement is necessary to save water but the concept must result in a system that combines both measurement and monitoring without the presence or any manual interruption of the consumer. The smart digital water flow surveillance system is presented in this paper. This system is available to measure and manage water consumption. The processed results will be published with the help of a Wi-Fi module for and displayed in the smartphone with the help of an android application [6]. The android application is used for the quick access and control of the device from anywhere. These can be supported in all versions and it can be updated and new supports can be added when it is needed. The smart digital water flow surveillance system can reduce the cost of the system. This system uses IoT for fast sharing of information to the user.

1.1Related Work

Nihil R, Riya Rajan, Rangit Varghese [2019]
Proposed the Water Quality Monitoring System is a real-time water quality measurement system focused on GSM. The system is incredibly robust and cost-effective. This machine tests various criteria relating to the water and sends them to the control center. It can automatically track the quality of water and is low in cost and does not require duty staff. Authorized users can access the data by logging in to the Thing Speak website. By entering the registered user ID and password, it will be led to the web page where the parameters will be shown in real-time in the form of plots. [1]

ImranB, Shakir Ahmed Sha KS, PavethraM, Siva Sankari k, Kavitha [2018]
Proposed a research that helped to designed and managed by a Wireless Sensor Network (WSN) which helps to track the quality of water with the aid of information sensed by sensors immersed in water, in order to keep the water resource within the norm defined for domestic use and to be able to take the necessary measures to restore the health of the deteriorated water body. The introduction of industrial process regulation is made possible through the use of the Internet. [5]

GowthamyJ, ChintaRohith Reddy, PijushMeher, SaranshShrivastava, Guddu Kumar [2018]
Proposed a study by installing this device in the smart city, it will be able to collect and evaluate the trends of residents ' water usage and save a lot of water from waste. The Internet of Things (IoT) is a revolutionary concept, that has the potential to turn almost anything into a smart thing. IoT provides an interface to track and work remotely from anywhere and at anytime. Existing liquid level control systems are commonly used for controlling liquid levels, reservoirs, silos and dams, etc. The device suggested is used for the home/office. [3]

SMART DIGITAL WATER FLOW SURVEILLANCE SYSTEM USING IOT

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Abstract: *The idea of a Smart digital water flow surveillance system is for the Smart buildings, Colleges, Hospitals, Industries, and Homes. In our day to day life, we see our cities facing many problems with water wastage, which leads to water scarcity and water pollution due to the overflow of water along roadsides. The main process is to save the water and monitor the usage of water. The wastage of water will also affect the environment and can cause water pollution due to the addition of oils and pesticides around the land. The most important need for having a smart way of life is by saving water. The Smart digital water flow surveillance system is a new idea to save water. It can send information through IoT to an android application of the user about the filling and empty water tank and it can also detect the water flow from the public water line. This system also used to measure the usage of water by the user using the water flow meter. Every process of the system is updated in an android application for user convenience.*

Index Terms **- PIC16F877A, Moisture sensor, Floating sensor, Wi-Fi module, Water flow sensor, Solenoid valve.**

I.INTRODUCTION

The world is getting automated more day by day and hence an eco-friendly technique is essentially required. Water management is the most required process around the world. Water usage can be estimated by monitoring and measuring the water utilized by a person. So far, the technology is much developed but there is a need for innovation. The concept provides a plan for reducing the wastage of water[4]. Nowadays, most of the industries are given rebirth with automation but, the local is still backward in automation. It is also equally important to have a low cost, robust and simple system to monitor the water consumption in the residence using an automated system.

The implementation of concept may differ among countries; insufficient water is a major issue among most developing nations. Since, less water usage is always welcomed wide over the world. Water management has an important commitment to ensure water consumption awareness and to avail of the measurement to the consumers. Mostly, the usage is unlimited due to the lack of measurement. In some cases, consumer involvement is necessary to save water but the concept must result in a system that combines both measurement and monitoring without the presence or any manual interruption of the consumer. The smart digital water flow surveillance system is presented in this paper. This system is available to measure and manage water consumption. The processed results will be published with the help of a Wi-Fi module for and displayed in the smartphone with the help of an android application [6]. The android application is used for the quick access and control of the device from anywhere. These can be supported in all versions and it can be updated and new supports can be added when it is needed. The smart digital water flow surveillance system can reduce the cost of the system. This system uses IoT for fast sharing of information to the user.

1.1Related Work

Nihil R, Riya Rajan, Rangit Varghese [2019]
Proposed the Water Quality Monitoring System is a real-time water quality measurement system focused on GSM. The system is incredibly robust and cost-effective. This machine tests various criteria relating to the water and sends them to the control center. It can automatically track the quality of water and is low in cost and does not require duty staff. Authorized users can access the data by logging in to the Thing Speak website. By entering the registered user ID and password, it will be led to the web page where the parameters will be shown in real-time in the form of plots. [1]

ImranB, Shakir Ahmed Sha KS, PavethraM, Siva Sankari k, Kavitha [2018]
Proposed a research that helped to designed and managed by a Wireless Sensor Network (WSN) which helps to track the quality of water with the aid of information sensed by sensors immersed in water, in order to keep the water resource within the norm defined for domestic use and to be able to take the necessary measures to restore the health of the deteriorated water body. The introduction of industrial process regulation is made possible through the use of the Internet. [5]

GowthamyJ, ChintaRohith Reddy, PijushMeher, SaranshShrivastava, Guddu Kumar [2018]
Proposed a study by installing this device in the smart city, it will be able to collect and evaluate the trends of residents ' water usage and save a lot of water from waste. The Internet of Things (IoT) is a revolutionary concept, that has the potential to turn almost anything into a smart thing. IoT provides an interface to track and work remotely from anywhere and at anytime. Existing liquid level control systems are commonly used for controlling liquid levels, reservoirs, silos and dams, etc. The device suggested is used for the home/office. [3]

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POINT OF INTEREST RECOMMENDATION ENGINE

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Abstract—The popularity of location-based social networks (LBSNs) has led to an enormous amount of user-based check-in data.Recommended Points of Interest (POIs) plays a key role in meeting the needs of LBSN users. While recent work has explored the thought of adopting a collaborative ranking (CR) for recommendations, few attempts are made to include time-based information for POI recommendations using CR. In this article, we propose a two-phase CR algorithm that comes with the geographical influence of POIs and is regularized supported the variance of recognition of POIs and user activities over time.Time-sensitive regularized penalizes users and POIs that have been more time-sensitive in the past, helping the model to account for long-term behavioural patterns while learning from user-POI interactions. Moreover, in the first phase, it attempts to rank the visited POIs higher than the unvisited ones and, at the same time, to apply the geographical influence. In the second phase, our algorithm attempts to rank the preferred POI users higher on the recommendation list. Both phases use a collaborative learning strategy that enables the model to capture complex latent associations from two different perspectives. Real-world dataset experiments show that our proposed time-sensitive collaborative ranking model beats the state-of - the-art POI recommendation methods.

Keywords — Point-of-interest recommendation, time-aware recommendation, collaborative ranking, location-based social networks.

I. INTRODUCTION

With the launch of location-based social networks (LBSNs) such as Yelp, Trip Advisor and Foursquare, users can share check-in data on their mobile devices. LBSNs collect valuable information about mobile user records with check-in details. Generating Points of Interest (POIs) guidelines play a key role in addressing user needs, such as exploring a new POI or visiting a city. In reality, every city has multiple POIs , and a user may have visited just a few in her hometown as well as when out of town.POI Recommendation attempts to ensure the satisfaction of users by proposing to them the most interesting locations in theirvicinity, taking into account their preferences and contextual constraints.

The accuracy of POI recommendation is constrained by many challenges. For example, data scarcity is a major challenge in Recommendation of the POI. Despite the fact that there are LBSNs with a large number of locations, in practice users visit a very limited number of locations, making the user-item matrix sparse. Moreover, as users spend most of their time in their hometown, the data scarcity problem is aggravated when a user visits a new city where has no history of visited locations. Some studies seek to address the question of data scarcity by integrating additional data into the model, such asgeographical and temporal data.The data scarcity problem is actually even worse when suggesting POIs as opposed to other things like movies or songs.This is mainly due to the fact that the check-in data provides an implicit feedback whereas users usually express their

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GAS LEAKAGE MONITOR AND CONTROLLER

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Abstract — Liquefied petroleum gas (LPG) is one that is inescapable in everyday life. LPG is used as a propellant and a refrigerant in a wide variety of applications including heating and cooking appliances, industrial applications, in cars. Gas leakage is one of the major concerns with commercial premises, conveyor vehicles driven by residential and gas. LPG leakage creates dangerous and unfriendly environmental gases that affect humans and other living creatures. Considering that safety plays a major role in today's world, it is necessary to implement good security systems at domestic or industrial sites. Setting up a gas leak detector at vulnerable locations is a preventive measure that can be taken to avoid the danger associated with gas leakage. The principal objective of the Gas Leakage Detection and By developing an automatic system that can detect the leakage of liquefied petroleum gas (LPG) at home and At the same time control it by turning off the regulator using a DC motor, Automated Control System is to provide a solution. , the window of that room is automatically and an SMS alert is sent to the house owner using the GSM module.

Keywords — LPG, MQ3 gas sensor, SMS, GSM module, Solenoid valve, PIC Micro controller, Relay Driver.

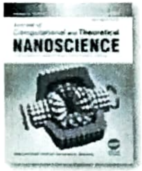
I. INTRODUCTION

There are several solutions to fireplace incidents that are continually approved by agencies. Sources of those devices include smoke detectors, heart alarms, hearth extinguishers, and sprinklers.Such devices can also alert or prevent the fire from unfolding when reflected, but they don't save you heart injuries and that alone is already a major downside.

This has a look at makes a specialty of the LPG fuel and the way to save you it from causing greater injuries. There is a desire to build a system that helps the incompetence of people in their climate, even as it avoids the start of the conflagration. The system also implements a shut-off mechanism that acts as the first line of defense within the prevention of the accident inside the residence should be an absence of the person. Liquefied Petroleum Gas (LPG) is a highly flammable chemical blend of propane and butane. It is odorless gas which adds ethanethiol as a powerful odor ant, so that leakage can be detected easily. Some people have a poor sense of smell that may or may not respond to low gas leakage concentration. Nonetheless, most of the disaster usually occurs in homes or industries due to gas leakages, leading to several accidents and also causing human life. Some people have a low sense of smell, which may or may not respond to low gas leakage concentrations. Detection of gas leakage is not only important but it is equally essential to control leakage. A system is designed that senses and controls the leakage of LPG gas by switching the regulator off using Solenoid Valve and sending an SMS alert to the house owner to alert that Gas Was Leaked.

II. SYSTEM OVERVIEW

The Systemcomprisesofconsistsof PIC Micro controller, Gas sensor(MQ3),GSM Module(SIM300), Solenoid Valve, Relay Driver,asshowninFig.1.



Exploring Refractive Index Ultra Compact Nano Sensor Using Photonic Crystal Resonant Cavities

Authors: Mohammadi, Masoud [1]; Seifouri, Mahmood [1]; Boyerahmadi, Elham [2]; Udaiyakumar, R. [3];

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DOI: https://doi.org/10.1166/jctn.2020.9271

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ADD TO FAVOURITES

References
Citations
Supplementary Data

Abstract   References   Citations   Supplementary Data

In this paper, an ultra-compact photonic crystal sensor based resonant cavities is proposed with improved quality factor, sensitivity and detection limit. The proposed sensor has 2D pillar photonic crystals with hexagonal array of dielectric rods. The refractive index of dielectric rods, radius of rods, filling factor *(r/a)* and lattice constant of the proposed structure are 3.46, 108 nm, 0.2 and 542 nm, respectively. The mean transmission efficiency, Quality factor, sensitivity, Figure of Merit (FOM) and limit of detection (LOD) are calculated as 92.2%, 9975.8, 371 nm/RIU, 2366 and 4.5 x 10^{-5} RIU, respectively. The corresponding electric field distributions and it band characteristics are studied using finite different time domain method (FDTD) and plan wave expansion (PWE). The cross-section of the proposed structure is 86 $/xm^2$ and is desirable for photonic integrated circuits (PIC) and ultra-compact optical sensors.

Keywords: Detection Limit; Photonic Crystal Sensor; Quality Factor; Sensitivity

Document Type: Research Article

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Conflagration and logging detection

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Abstract

The forest fire and deforestation has an adverse effect in environment. A wild land fire is an uncontrollable fire that occurs mainly in forest areas, it also occurs in urban or agricultural areas. Among the most causes of wildfires, human factors, either intentional or accidental, are the foremost usual ones. The number and impact of forest dangerous fires are expected to grow as a consequence of the worldwide warming. In order to fight against these disasters, it's necessary to adopt a comprehensive and multiple approaches that permit endless situational awareness and instant responsiveness. The main intention of this project is to provide forest security by preventing unauthorized cutting of trees and forest fires. The detection device used to detect the forest fire and deforestation comprises of multiple sensors such as LM35 temperature sensor, MQ3 smoke sensor, Flame sensor and PIR sensor to indicate the fire in different factors. Arduino board and Wemos D1 are used to control all these sensors. The program will be loaded and uploaded in Wemos. An application was developed to connect and work in a single server. The detected information will be send to user mobile and mobile apps using SMS and Wi-Fi interface by the Arduino.

Keywords Arduino UNO, Wemos D1, GSM.

1. Introduction

Nowadays forest fire occurs very frequently. It causes great damage to the great extension of forest land and destroys habitats like animals and birds. Due to the forest fire some rare species of trees and medicinal plants get extinct. Forest fire increases carbon-di-oxide levels in atmosphere contributing to greenhouse effect and climate changes. It destroys much of the soil and erodes the soil causing flood and landslide. The entire forest ecosystem will also be collapsed. In earlier days fire occurs naturally, ignited by heat from the sun. One of the main reasons of natural occurrence of forest fire is due to the departure of the lightening strike, sometimes collision of two siliceous rocks that also produces spark which results in the minimal impact of fire. Naturally occurring fires can be quickly detected as they have only one outbreak. However most of the wildfires are due to human's uncontrollable activity and carelessness such as lit cigar, not burning debris properly, fireworks, arson and camp fire and also due to the damage of power lines or military accidents. Next to the forest fire deforestation has an adverse effect on society. Development of urbanization and the construction of industries and factories in rural areas are the major reasons which results in deforestation. Since the dams are constructed across the river it results in destruction of forest cover. Farming, cattling, logging for materials also results in deforestation. 70% of animals and plants live in forest and deforestation leads to destroy their homes, since they provide shelter for some rare species of plants. Deforestation not only reduces the level of ground water but also that results in water scarcity. Logging of trees results in the release of large amount of green house gases into the atmosphere and also leads to global warming. It decreases the level of pollution that could be controlled by the nature warming and climate changes. Soil erosion is being caused by wide spread deforestation. The proposed unique solution helps to overcome the above

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Opulent Futuristic Smart Sensing Garden

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Abstract— The project proposed here is an automatic public garden system which uses a PIC16F877A controller. The PIC controller is used to control the entire system. The hardware components required for this project are PIC16F877A, timer, battery, DC motor, humidity sensor, relay, solar panel, water level sensor, voice module, IR sensor. The project is an automatic design in which PIC controller controls the entire public garden system like gate, water system, lights and dustbin. Initially, the controller switches ON the entry gate that is opened for certain time, after some time the exit gate will also open. A voice indication is given to alert the public for closing time of garden then both gates will be closed. An IR sensor is fixed in the exit gate which is used to exit the people stuck inside the garden after closing time. Lights are automatically turned ON and OFF using timer. Based on humidity sensor the DC motor will supply water by using water sprinklers. If the water level in tank is beyond a certain fixed level the motor will automatically ON and fills the tank by using water level sensor. For disposal of garbage we introduce a smart garbage system which has two dustbins in which if one dustbin is filled by trash it gets automatically closed and another dustbin will be opened. The filled dustbin is indicated by LED and a message is send to the corresponding authorities for disposal. The overall power supply to the garden is generated and provided internally using a renewable energy.

Keywords— PIC16F877A, Timer, Moisture sensor, Water level sensor, IR sensor, GSM, Solar panel

I. INTRODUCTION

At present the public gardens are playing a vital role in our society. Garden helps to keep cities cool and act as a place of recreation. In crowded cities, it will be difficult to maintain a clean and secure public garden. The most important problems faced in public garden are the misuse of electricity. Sometimes carelessness of the workers will result in wastage of electricity. The water wastage is an another issue which will be faced in gardens. Due to improper watering, plants are suffering from prolonged drought or high humidity which causes infection to the greeneries. In addition, it requires manpower to open and close the garden's gate.

The improper maintenance of trash is a big problem in gardens. This can cause spread of pest species and many diseases. So by implementing a smart garbage system this can be overcome which is also easy to maintain. There is a need of external power supply from the Electricity Board for the garden. To overcome this, we use renewable energy will play a vital role to generate the needed power for the garden. By implementing the project named as '**Opulent Futuristic Smart Sensing Garden**' all the above situations can be avoided which is used to develop a smart city.

II. RELATED WORK

Pawar P.M, et al (2016) proposed an automatic garden monitoring system that is used for household gardens and can be expanded to greenhouses. It is a microcontroller based project. It helps to reduce the human efforts and makes the appropriate use of water resources to improve the health and life of plants [1].

Mr. Mahadev Vilas, et al (2017) proposed a project that helped to gain a better knowledge on various aspects related to automation. Using this system the farmers can utilizes the available resources efficiently without wastage. The user can feed the input through the GSM so that a particular condition will turn on for a predefined time [2].

Ramkumar.E, et al (2018) proposed the plant monitoring and smart gardening using IoT in the Raspberry Pi platform. The main goal of automation is to make the people comfort by reducing manual work. All the sensors in this system connected with the Raspberry pi and the information about the garden is directly monitored and controlled by the owner through smart phone [5].

R.B.Thombare, et al (2018) proposed a public garden automation by using arduino. To control the wastage of

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Opulent Futuristic Smart Sensing Garden

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II. RELATED WORK

Pawar P.M, et al (2016) proposed an automatic garden monitoring system that is used for household gardens and can be expanded to greenhouses. It is a microcontroller based project. It helps to reduce the human efforts and makes the appropriate use of water resources to improve the health and life of plants [1].

Mr. Mahadev Vilas, et al (2017) proposed a project that helped to gain a better knowledge on various aspects related to automation. Using this system the farmers can utilizes the available resources efficiently without wastage. The user can feed the input through the GSM so that a particular condition will turn on for a predefined time [2].

Ramkumar.E, et al (2018) proposed the plant monitoring and smart gardening using IoT in the Raspberry Pi platform. The main goal of automation is to make the people comfort by reducing manual work. All the sensors in this system connected with the Raspberry pi and the information about the garden is directly monitored and controlled by the owner through smart phone [5].

R.B.Thombare, et al (2018) proposed a public garden automation by using arduino. To control the wastage of

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Newfangled Immaculate Trash Can Tracking System

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[3, 4, 5, 6]*Bachelor of Engineering Students, Department of Electronics and Communication Engineering, Kathir college of Engineering, Tamilnadu, India.*

Abstract: ***The idea of trash can monitoring systems is for the Smart buildings, Colleges, Hospitals and Bus stands. In our day to day life, we see our cities facing many problems with garbage overloading, which leads to producing green-house gases and it leads to polluting our environment and also it is harmful to humans. The main natural process is the greenhouse effect that warms the earth's surface.***

The emission of greenhouse gases can also affect the ozone layer. The most important need for having a smart way of life is being clean smart garbage system. Trash can monitoring system is a new idea of implementation which makes a normal dustbin as smart using Arduino Uno and GSM modules are used to send the SMS. The proteus software tool is used to create the schematic diagram of our project.

The trash can will constantly measure the level of garbage in the bin and automatically detect if any toxic gases present in the bin and also detect any burning occurs in the garbage and it Sense and sends a message to the higher authority. If that cleaning team will not initiate cleaning, then the dustbin will automatically move by using the line follower sensors to dispose of the waste at the desired location.

Keywords: Arduino, GSM, ultrasonic sensor, gas sensor, temperature sensor, Proteus tool, and line follower robot.

I. INTRODUCTION

All cities in the world are facing great challenges due to increasing urbanization and one of the major challenges is reducing the amount of dumping waste. In many public places, we see that garbage bins are kept but they have not been cleaned. Overflow of waste causes air pollution, land pollution, and respiratory problems. Some gaseous compounds are extracted from the wastes in the bin, it can cause health effects by causing shortness of breath, headaches, eye irritation. Some of the industries produce toxic products that are thrown away into normal dustbin against the rule.

Though the dustbin is filled there is a formation of gases such as ammonia, carbon dioxide, and methane and some of the contents in the garbage that react with each other and release Sulphur & Nitrogen. Burning of garbage releases very poisonous carbon monoxide gas in the air. This may cause fire and pollute the atmosphere severely. Fire can also occur due to people's careless and they are unaware of the burnings & combusting material. This fire may also spread to homes, working area & causes a threat to the surroundings.

To reduce these problems we can use the existing technology to sense these unusual conditions. Using the level monitor like an ultrasonic sensor we can sense the level of waste in the dustbin [1]. Using the gas sensor we can sense the formation of hazardous gases like CO2, SO2, NO2, methane, and ammonia. Fire sensor is used to sense the temperature level in the garbage if any burning occurs it senses it. GSM & Arduino module is used to transfer data and messages.

If any unusual condition occurs in the waste like overflow, toxic gas or any burning of waste then it senses and sends the message or voice call to higher authority and scavengers for cleaning [3]. After sending these messages, if the scavengers are not coming to clean the waste.

Then the dustbin will automatically move towards disposing of the waste. Here the line follower concept is used. These line follower sensors are used to move the dustbin in that pre desired path or black line. When it reaches that destination it automatically disposes the waste at the desired location [5]. Upload the code to Arduino after setting up the smart trash can and providing a 5V power supply to the Arduino board to circuits. Thus using this method we can avoid some undesirable health problems and environmental pollutions. Using this idea we can make our India as smart cities.

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IOT Based Refuse Reuse Recycle Technique for Zero Waste Management

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Abstract : In almost all parts of the world there is no a proper solution for the disposal of waste. There is no proper monitoring and maintenances. The trash may overflow at times and make the city look unclean as well as it leads to the spread of various infections. If the trash pertains for more than a week in the same place it leads to the release of various toxic gases which may affect the children and old age people living in that area. The main idea of this project is to maintain the city clean by a proper collection of waste and not allowing it to overflow. At the same time, it makes utilization of biodegradable waste as natural manure to enhance crop production with the help of the bokashi composting technique. This method effectively increases crop production all over the world by 40%. So, it reduces the risk of disposing waste or dumping it under the water.

IndexTerms - PIC microcontroller, GSM, Servo motor, LCD display, DC motor, Infrared sensor, Dustbin, Mobile phone.

I. INTRODUCTION

In India, almost 60 million tonnes of waste are generated every year. Out of these, only 20% of waste is treated and the remaining 80 % of waste is either dumped as landfill into the earth or in most cases it is burnt. Both of these cases cause great disaster to the earth. Burring the waste deep into the ocean may lead to depletion of water organisms and burning of waste might cause depletion of the ozone layer.

The major problem faced all over the world is the scarcity of food. Totally 11% of the Earth's land area is utilized for agricultural purposes. Nowadays, the remaining agricultural area is also destroyed due to the construction of various buildings and it is also destroyed due to various natural disasters. If this situation prevails there will be a dramatic decrease in crop production. The usage of artificial manure may lead to decreased crop production and produces unhealthy crops that would be harmful for human consumption

To maintain the city clean and reduce the deposition of waste onto the earth and at the same time to increase the total crop production by 40% it paves way to go for the REFUSE REUSE RECYCLE concept.

There are 3 types of composting techniques like

1.Normal Composting,
2.Vermi Composting,
3.Bokashi Composting

But the first two has the following drawback. The biodegradable trash thus obtained is again segregated into GREEN AND BROWN trash and mixed up in a 50:50 ratio. They must be exposed to air whenever needed and needs sunlight at times. There is a chance of forming anaerobic bacteria which might be harmful to live beings. Due to all these complications, advised to adopt the BOKASHI COMPOSTING technique. Where an alternate layer of BOKASHI POWDER and trash is mixed up and placed in an airtight container and it is left undisturbed for 2 weeks. The extract thus obtained can be sprayed onto the crop which act as a natural fertilizer and increases the crop yield by 40%

II. LITERATURE SURVEY

In the former adopted methods, there was a hole dug inside, above which a polythene bag was covered. The biodegradable waste followed by a layer of cow dung and phosphate powder is sprinkled evenly. Then the setup is covered by a layer of cow dung and is left undisturbed for a period of 3 to 4 weeks. Now cracks start developing in its above layer at that time earthworm is introduced into its cracks. The top surface is covered with a layer of polythene bag and is checked periodically and water is sprinkled above it to avoid dryness. After a period of 4 to 5 weeks the earthworm digest all the degradable waste and turns it into manure and the corresponding manure is segregated from earthworm using a sieve and is packed and stored in a cool dry place. The casting analysis revealed that cow dung slurry along with paper and organic waste is converted into manure that is used to enrich the soil value by a small amount and reduction in C: N ratio make the plant to uptake quire people on duty.

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HIGH LEVEL WING

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Abstract: *The main focus of this project is to develop and design the mechanism of high level wing for lifting. It is controlled by an Arduino Uno microcontroller which accepts the input data's from the user. This high level wing working prototype is made up of a motor, camera accessed by ip webcam, gripper with a two relays and a Arduino board. These are connected together and are operated by ubidots software. In line with the human hand motion robotic arm additionally circulate and reacts the same. This will be accomplished from anywhere, we decided to overcome the positive difficulty approach by means of accessing the arm using an external joystick, in order that it is far easier than the preceding method. By the usage of the camera we able to stumble on the goal speedy and it enable to attain the target with the aid of the usage of this arm that is managed externally via a person. As machines develop even greater sensible, they're emerging no longer simply as a effective tools, but close companion. The control assignment of this is to govern the movement of robot arm from source to the destination spot. This could be done by the way of controllers within the Arduino which include certain specifications*

Keywords: *Gripper, Stepper Motor, WEMOSD1, RF Module, Wi-Fi Module.*

1. INTRODUCTION

Robotics may be a current emerging technology within the field of science. A number of universities in the world are working in this field. Robotics is that the new emerging booming field, which can be of great use to society in the upcoming years. Nowadays many sorts of wireless robots are being developed and are put to varied applications and uses.

The developed robotic arm, with learning and resources, which is operated & controlled wirelessly with the help of accelerometers which uses Rf module to transmits signals to the robot through an auto device manually through the hand and leg movement [3]. The Robot moves and acts in the manner depending on the gestures made by the hand and leg. The robot moves in up, down, left or right directions and picks up objects from one place and keeps at another desired place as directed by the movements of human. It is a TYPE — C Robot, servo controlled with continuous or point to point trajectories. The pre-defined arm are working in the form of wrapping a detectors in the arm of a human being [3].

By discussing the brand new frontiers of robot physical interplay with people, describing motivations and packages of safe pHRI (bodily human-robot interplay). The technical challenges to increase new robot structures for secure and powerful collaboration with people are mentioned, Sub-dividing the exposition into palms-off and fingers-on pHRI (physical human-robot interaction) systems [9]. We present a summary of the applicable safety standards and their ongoing development. It can be very useful when the arm is controlled externally, so that it can be make the movements according to the need and by using this technique it can make the needful for the human beings [3]. This can be done with the help of the Arduino boards connected to the hands which are programmed in order to do the favor. Hence, with the use of this, the desired result can be obtained. To make the life better than creating a modern world, we make use of the technology to develop the nation as well as the life of a being.

2. LITERATURE SURVEY

In the wireless gesture technique, microcontrollers accelerometers, degree of freedom, IP, RF modules are used. One accelerometer is mounted on the human hand and another on a leg from which the arm can be moved according to the movement of the human hand and leg, where hand movement captures the behavior and leg movement shows the platform movement

Intelligent Load Power Manager for Solar Powered Portable Devices

N.Vijayalakshmi, Dr.P.Maruthupandi

Abstract

The performance of real time solar energy converters and solar energy scavenging devices depends solely upon the speed and efficiency of the power management among the input, output and conversion ends. Hence this paper concentrates on designing of reconfigurable, reprogrammable, efficient Intelligent Load Power Manager (ILPM) system depicting low power, high precision and zero lag operation. (FPGA) Field Programmable Gate Arrays prove to be robust, low cost, high efficient methodology that works well in analog as well as in digital platform. Hence, FPGA based implementation of an Intelligent Load Power Manager (ILPM) is proposed for solar energy harvesting portable / remote devices. The input renewable power is stepped up with help of the DC DC Converter and the boosted voltage is given as input to the portable load. Since the harvested energy is not regular throughout the load requirement, a storage setup is made to meet up the lad needs. FPGA based ILPM proves to be an energy efficient module which controls the connectivity of the load needs and operation of the converter.Simulation and implementation of the Proposed FPGA based ILPM is done with Xilinx software 12.1 version.The dynamic power consumption of the proposed ILPM is found to be low. The obtained simulation output shows a comparative higher efficiency (96.2%), a decrease in chip area usage 130 $\mu m^2$and reduction in operation time as 4.283ns.

Keywords: Solar Energy Scavenging, Power Manager, FPGA, chip area, DC-DC Converter.

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Section
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An Investigation into the Tribological Properties of Bidirectional Jute/Carbon Fiber Reinforced Polyester Hybrid Composites

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ABSTRACT

In this work, the tribological performance of bidirectional jute/carbon fiber reinforced polyester composites was investigated using response surface methodology. The effects of three factors namely fiber weight fraction, load, and sliding velocity on the wear and friction values were examined. The composites were fabricated by using compression molding technique and the dry sliding test was conducted using pin-on-disk machine. The response surface methodology coupled with three factors – three-level Box-Behnken design was employed to examine the interactive effects of process variables on wear loss and coefficient of friction. Moreover, Analysis of Variance technique was used to inspect the statistical significance of the developed model. The outcomes revealed that the wear loss increased with the increase in sliding velocity and load and decreased with the increase in weight volume fraction due to diminishing contact between the polyester matrix and rotating disk. However, the coefficient of friction decreased with the increase in process variables. Furthermore, the morphology of worn-out samples was examined using scanning electron microscopy to understand wear mechanisms.

KEYWORDS

Natural/synthetic fibers; wear loss; coefficient of friction; RSM; ANOVA; wear mechanism

关键词

天然/合成纤维; 穿损失; 摩擦系数; 磨损机制

摘要

采用响应面法对黄麻/碳纤维双向增强聚酯复合材料的摩擦学性能进行了研究. 考察了纤维质量分数、载荷和滑动速度三个因素对摩擦磨损值的影响. 采用压缩成型工艺制备了复合材料，并在盘式针机上进行了干滑动试验. 采用响应面法结合三因素三水平Box-Behnken设计，研究了工艺变量对磨损损失和摩擦系数的交互影响. 采用方差分析技术对所建立的模型进行统计显著性检验. 结果表明，由于聚酯基体与转盘之间的接触减小，磨损量随滑动速度和载荷的增加而增大，随重量体积分数的增加而减小. 但随着工艺变量的增加，其系数逐渐减小. 此外，用扫描电子显微镜观察磨损样品的形貌，以了解磨损机理.

Introduction

The light weight structural members of automobiles, aerospace and other commercial fields are manufactured using fiber reinforced polymer composite materials due to their superior mechanical properties combined with high strength to weight ratio (Nagarjun, Kanchana, and Rajesh Kumar 2020). These polymer composites are usually developed by reinforcing the synthetic fibers like carbon, glass, aramid, and Kevlar in to the thermosetting and thermoplastic polymers which gives good overall performance (Nagaraja et al. 2020). However, in recent day the new legislations and growing environmental awareness boosted the use of natural fiber reinforced composites in various applications, because these natural fibers are biodegradable, light weight

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An Investigation into the Mechanical and Wear Characteristics of Hybrid Composites: Influence of Different Types and Content of Biodegradable Reinforcements

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ABSTRACT

This research work focuses on the wear characteristics of hybrid composites prepared using Sisal fiber (SF) /Pineapple fiber (PF) and Pineapple fly ash (PA) in various wt.%. Linear reciprocating tribometer was used for determining the Specific Wear Rate (SWR) and Coefficient of Friction (CoF) of the hybrid composites. The XRF results of PA filler showed the existence of silica (64.43%) and aluminum oxide (10.03%) in a major percentage. The hybrid fiber combination of 30-50 wt.% showed improvement in Tensile Strength (TS), Flexural Strength (FS) and Impact Strength (IS) with the filler mixing up to 5 wt.%. The Taguchi optimization (SN graph) observed the combination with PA addition of 5 wt.%, hybrid fiber addition of 30 wt.%, sliding distance and load of 1500 m, 10 N having lower SWR. Similarly for lower CoF, fly ash of 1 wt. %, fiber of 30 wt.%, sliding distance and load of 500 m and 5 N, respectively, with high SN ratio is the best combination. SEM results showed a decrease in filler content, higher load conditions, higher reinforcement causing more surface deformations in the composites.

摘要

研究了剑麻纤维/菠萝纤维（PF）和菠萝粉煤灰（PA）在不同重量%下制备的混杂复合材料的磨损特性. 采用线性往复摩擦磨损仪测定了混杂复合材料的比磨损率（SWR）和摩擦系数（CoF）. PA填料的XRF分析结果显示二氧化硅（64.43%）和氧化铝（10.03%）占主要比例. 当填料掺量达到5 wt. %时，混杂纤维的拉伸强度（TS）、弯曲强度（FS）和冲击强度（IS）均得到改善. 田口优化（SN图）观察到PA添加量为5%，混杂纤维添加量为30%，滑动距离和载荷为1500m，10n的组合具有较低的SWR. 同样，对于较低的CoF，粉煤灰质量分数为1%，纤维质量分数为30%，滑动距离为500m，荷载为5n时，高SN比为最佳组合. SEM结果表明，填料含量的降低、载荷条件的提高、增强材料的增强作用使复合材料的表面变形增大.

KEYWORDS

Hybrid composites; wear; morphology; Taguchi optimization; ANOVA; reciprocating tribometer

关键词

混杂复合材料; 磨损; 形态学; 田口优化; 方差分析; 往复式摩擦计

Introduction

The necessity of using biodegradable resources is increasing daily due to the disadvantages of plastic usages. Natural fibers currently have a huge demand in the field due to its availability, eco-friendly nature, low cost, better wear properties, vibration and damping nature, low density and mechanical properties (Kavitha, Hariharan, and Rajeshkumar 2017; Li et al. 2020; Sumesh and Kanthavel 2019a). These reinforcements are used in acoustics, automobile interiors, civil construction, roof tiles, packaging sector and partition board

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Assessment of Hydrostatic Stress and Thermo Piezoelectricity in a Laminated Multilayered Rotating Hollow Cylinder

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KEYWORDS

Initial hydrostatic stress
Thermoelasticity
Longitudinal waves
Bessel function

ABSTRACT

In this paper, we built a mathematical model to study the influence of the initial stress on the propagation of waves in a hollow infinite multilayered composite cylinder. The elastic cylinder assumed to be made of inner and outer thermo piezoelectric layer bonded together with Linear Elastic Material with Voids (LEMV) layer. The model described by the equations of elasticity, the effect of the initial stress and the framework of linearized, three-dimensional theory of thermo elasticity. The displacement components obtained by founding the analytical solutions of the motion's equations. The frequency equations that include the interaction between the composite hollow cylinders are obtained by the perfect-slip boundary conditions using the Bessel function solutions. The numerical calculations carried out for the material PZT-5A and the computed non-dimensional frequency against various parameters are plotted as the dispersion curve by comparing LEMV with Carbon Fiber Reinforced Polymer (CFRP). From the graph, it is clear that those are analyzed in the presence of hydrostatic stress is compression and tension.

1. Introduction

Composite materials are generally utilized in en-gineering structures because of their predominance over the basic materials in applications requiring high quality and solidness in lightweight parts. Thusly, the portrayal of their mechanical conduct is taking imperative part in basic plan. Procedures that incite transversely isotropic flexible properties in them make most cylindrical parts, for example, poles, wires, cylinders, funnels and strands. Displaying the proliferation of waves in these parts is significant in different applications, including ultrasonic nondestructive assessment systems, progression of room explore and numerous others. Smart materials are normally prestressed during the assembling procedure. As initial stresses are indivisible in surface acoustic wave gadgets and resonators, investigation of such impacts has been finished with various methodologies. A few creators have considered wave engendering in prestressed piezoelectric structure.

Soniya Chaudhary et al. [1] derived secular equation of SH waves propagating in prestressed and rotating piezo-composite structure with imperfect interface. Abhinav Singhal et al. [2] analyticaly analysed interfacial imperfection study in pres-stressed rotating multiferroic cylindrical tube with wave vibration. Lotfy and El-Bary [3] discussed photothermal excitation for a semiconductor medium due to pulse heat flux and volumetric source of heat with thermal memory. Lotfy [4] discovered a novel model for photothermal excitation of variable thermal conductivity semiconductor elastic medium subjected to mechanical ramp type with two-temperature theory and magnetic feld. Soniya Chaudhary et al. [5] studied anatomy of flexoelectricity in micro plates with dielectrically highly/weakly and mechanically complaint interface. Ebrahimi et al. [6] discussed Magneto-electro-elastic analysis of piezoelectric–flexoelectric nanobeams rested on silica aerogel foundation. Abhinav Singhal et al. [7] investigate mechanics of 2D Elastic Stress Waves Propaga-

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Bending analysis of generalized thermoelastic waves in a multilayered cylinder using theory of dual phase lagging

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Abstract. In this present problem, we construct the analytical model for wave propagation in a generalized thermoelastic multilayered composite hollow cylinder construct of inner and outer viscothermo layer fastened together by linear Elastic materials with voids (LEMV). To uncouple the equation of motion, and heat conduction equations, displacement potential functions are introduced. The frequency equations are derived for longitudinal and flexural modes of vibration and are studied numerically for heat conducting viscothermoelastic material. The computed dimensionless frequency is presented in the form of scattering curves against various physical variables. Adhesive layer LEMV is compared with Carbon Fiber Reinforced Polymer (CFRP).We found that the frequency wave characteristics are huge in physical variables in the presence of thermal parameter.

1. Introduction

The thermoelasticity applications are used in various branches of science and technology, so a reasonable consideration has been built since last few centuries. It is acknowledged that the postulate of coupled thermoelasticity deteriorate from physical defect that the thermal signal grow with the boundless speed.In order to the extensive use of materials under high temperature in current technology and with the modern development of polymer and plastic industry,the investigation of viscoelastic materials playing a vital role in solid mechanics.

The extended history of thermoelastic damping investigation established from Zener [1] and other authors Nayfeh and Yuxin Sun [[2],[3]] for dissimilar structures like plate,shaft, cylindrical panel etc.Bland and Christensen[[4],[5]] describes a long analysics of viscothermoelacity.Viscothermoelastic vibrations in micro-scale beam resonators with lincarly varying thickness and adducent analysis of circular micro-plate resonators by using generalized viscothermoelasticity theory of DPL model are briefly described by Grover [6],[7].The generalized thermoelasticity theory with the dual phase lag effect has been developed by Da Yu Tzou [8].Naggar,Abd-Alla,Fahmy and Ahmed [9] study about thermal stresses in a rotating non-homogeneous orthotropic hollow cylinder.Guo,Wang and Rogerson[10] analysis of thermoelastic damping in micro-and nanomechanical resonators based on DPL generalized thermoelasticity theory.Sharma,Grover and Sangal [11] statistically studied viscothermoelastic waves.Sharma,Mohinder Pal and Dayal Chand[12] investigated three-dimensional vibration analysis of a piezothermoelastic cylindrical panel.Paul and

Synthesis and characterization of cobalt-doped cadmium oxide thin films prepared by sol–gel spin coating method

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Abstract--In this work, cobalt-doped Cadmium oxide thin films are prepared by sol-gel spin coating technique on the glass substrate. The effects of annealing temperature and Co concentration on Structural, optical properties of the thin films are studied. XRD pattern indicates that a CdO single phase with a cubic polycrystalline structure is formed in all the samples. Prepared thin film samples were revealed by EDX analysis. Optical measurements show that the optical transmission of the layer is reduced and the optical-band gap decreases due to the increase in molar concentrations. The optical-band gap is decreasing while increasing of Co concentration and annealing temperature.

Keyword: Thin films, Cadmium oxide, Sol-gel, Spin coating, annealing

1. Introduction

In recent years, Oxide based materials such as ZnO, CdO, SnO_2, TiO_2 and In_2O_3 have attracted increasing interest [1]. Due to the optical, physics and electronic properties including excellent transmission of visible light and electrical conductivity CdO thin films have gives more attracted amid the numerous metal oxides [2]. In solid-state devices, Cadmium Oxide (CdO) makes an important semiconductor material for developing of various technologies. In visible and NIR spectral regions CdO thin films are transparent [3]. At 540 nm it is transparent in the solar spectrum. In the field of optoelectronic devices like solar cells, transparent electrodes, and photodiodes CdO have wide applications among others. To fabricate CdO/CdTe heterostructure solar cells with 9.1% efficiencies, CdO transparent conducting oxide with optical-band gap of 2.3 eV and an electron affinity of 4.5eV were used in DC magnetron sputtering [4].

The properties like structural, morphological and optical were affected by changing annealing temperature in successive ionic layer adsorption and reaction (SILAR) method. The optical-band gap was changed due to change in annealing temperature of 300 °C and 400 °C [5]. In thermal annealing method hydroxide phase with the structural transformation can be achieved.

CdO thin films were prepared in different methods like sol-gel [6], pulsed laser deposition [7], spray pyrolysis [8], sputtering [9], chemical bath deposition (CBD) [10], e-beam evaporation technique [11], pulsed filtered cathodic arc deposition (PFCAD) [12], successive ionic layer adsorption and reaction (SILAR) method [13,14],. Sol-gel spin coating method add more advantage to process high smoothness of the films, simplicity, low sintering temperature, the possibility for coating over the large-area substrate, high smoothness of the films, reliability, controllability, reproducibility, etc [15–20]. Moreover, some parameters are optional for coating like spin, speed, ambient, solution morality, drying, and annealing process [21].

Influence of Organic Additive Benzene Sulfamide on the Magnetic Behavior of Electrodeposited CoMnP Thin Film Alloys

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Electro deposition of CoMnP thin films was carried out for different concentrations of organic additive Benzene sulfamide at a constant bath pH value and for various current density. Magnetic properties such as coercivity, saturation magnetization and the surface morphology were investigated for electrodeposited CoMnP thin films. The characteristics of the CoMnP thin films were found to attain enhanced values, because of the variation in the concentration of the bath solution. The Scanning Electron Microscope (SEM) micrographs of the CoMnP thin films for various bath compositions and additive concentration exhibited different micro cracks. From the X-ray diffraction pattern, structure of the CoMnP alloy films was analyzed and it was found to be Hesagonal Close Packed (HCP) structures with the dominant microstructure and all the co-deposited thin films were found to exhibit Nano crystalline structure. The magnetic properties of the specimens were characterized using Vibrating Sample Magnetometer (VSM). Adhesion and hardness of the electroplated films influenced by organic additive Benzene Sulfamide were also investigated. The magnetic properties were highly influenced by the addition of the organic additive Benzene Sulfamide for various bath composition and bath conditions. Under best condition involving addition of 0.2 M of NaH_2PO_2 and 2 g/L of Benzene Sulfamide acid at current density 5 mA/cm^2 and time of deposition 60 Minutes, the thickness of the film was found to be 4.6 micrometer with coercivity 1500 Oe.

Keywords: CoMnP ALLOY FILMS; ENERGY DISPERSIVE X-RAY; ORGANIC ADDITIVE BENZENE SULFAMIDE; SCANNING ELECTRON MICROSCOPE (SEM); SPECTROSCOPY (EDS); VIBRATING SAMPLE MAGNETOMETER (VSM); X-RAY DIFFRACTOMETER (XRD)

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Influence of Organic Additive Benzene Sulfonic Acid on the Magnetic Behavior of Electrodeposited COMNP Thin Film Alloys

M.RM. Krishnappa, K.V. Kannan Nithin

Abstract: CoMnP alloy films were synthesized by Electrodeposition Technique. The Electrochemical deposition technique is especially interesting due to its low cost and high quality of deposit. Thin Magnetic films are extensively used in various electronic devices including high density recording media and micro electromechanical systems (MEMS). Electrodeposition being cost effective, in the present work cobalt based magnetic films was deposited electrochemically and characteristics features of the deposited film were studied. Effect of organic additives Benzene sulfonic acid in the presence of the sodium hypophosphite was studied. Structural and magnetic properties were investigated and reported. The hysteresis loops of the CoMnP alloy films were measured and studied. The result shows that organic additive Benzene sulfonic acid has altered the magnetic properties of the films. Among the different compositions, CoMnP compound exhibit good hard magnetic properties, Under the best condition involving addition of 0.2M of NaH2PO2 and 4 gL-1 of Benzene Sulfonic Acid at a current density of 7 mA-cm-2 and time of deposition 60 minutes, the thickness of the film was found to be 3.5 micrometer with coercivity 1410 Oe and remanent 0.12 emu.The reason for the change in magnetic properties and structural characteristics because of the additive were discussed.

Keywords—CoMnP thin films, organic additive Benzene sulfonic acid, Magnetic properties.

I. INTRODUCTION

Different actuation mechanisms for microactuators include electrostatic [1], Piezoelectric[2], thermopneumatic[3], bimetallic[4], electromagnetic[5], electrochemical[6] and shape memory alloys [7]. At present hard and soft magnetic material gains increasing interest in micro electro mechanical systems and micro optical electrochemical system devices, for example microaculators and sensors. In particular hard magnetic materials are advantageous to bidirectional actuation, which is needed in bidirectional actuation. The importance of electrodeposition as a fabrication technology in the electronic industry is large and growing. [8]. Development of microelectromechanical system [MEMS] requires hard magnetic films with both high coercivity and remanence [9]. Electrodeposited thin magnetic films are important in computer read/ write heads and MEMS because of their fiexibility, capability, quality and low cost. With the current trend towards miniaturization, high performance packaging, cost-competitiveness and electro deposition has become the dominant manufacturing technology in many new applications and remains firmly established in others. For example in micro electro mechanical system (MEMS) devices, data storage media, magnetic recording head and reading heads [8]. In addition to the above, Electrodeposition has been recognized as a preparation method characterized by remarkable degree of reproducibility. The electro deposition technique is especially interesting due its cost-effectiveness, quality deposits and easy maintenance. As CoMnP ternary alloy films are having hard magnetic properties various studies have been carried out to develop these thin magnetic films. Electro-deposition provides an easy way to produce these thin films with high quality[10]. As of now, various Co-based permanent- magnet materials have been electrodeposited because of the crystalline structure of cobalt is highly anisotropic. Numerous studies have been carried out to investigate binary and ternary Co based iron group magnetic films[11]. They mostly focused on the mechanism of anomalous codeposition, effect of plating, the effect of various additives and the corrosion properties. To our knowledge, there have been a few detailed studies on Co based magnetic films prepared using electro deposition [12]. The purpose of the present work was to study the influence of bath parameters (current density, pH, and time duration of deposition) mainly on the magnetic properties of electro deposited CoMnP thin films. CoMnP films were characterized using Vibrating sample Magnetometer (VSM), energy dispersive X-Ray Spectroscopy (EDS), X-Ray diffractometer (XRD) and the influence of the bath parameters on the film structure , composition, and magnetic properties were discussed. The influence of the organic additive Benzene Sulfonic Acid on the magnetic properties was also studied.

II. EXPERIMENTAL DETAILS

All the CoMnP films were electrodeposited at constant pH value 3.00.The CoMnP films were electro deposited on Copper substrates of size: breath; 20 mm X Length ;120 mm X Thickness 0.1 mm. Pure Cobalt of the same size was used as anode. Current for electrodeposition was passed from a regulated direct current (DC) unit. Analytical reagent grade chemicals were used to prepare baths Solution. Each and every

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Idle Vehicle Detection and Traffic Symbol Analysis using Artificial Intelligence and IoT

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ABSTRACT

The emerging development in smart vehicles has improved transportation seamlessly. This paper deals with incorporating the modern technologies like Artificial Intelligence and Internet of Things(IoT) with the traditional transportation system. It states how AI algorithms can be integrated with IoT powered vehicles to manage and avoid crashing with idle vehicles on a speedway and assists for safer driving using the traffic symbol analysis to reduce accidents. Several communication standards for data transmission between the vehicle and control system has been stated. It also provides additional features like emergency or assistance for vehicles in speedway. It uses complex learning and analysis algorithms to improve the efficiency of driving and reduce rear-end collisions. This paper hence gives a comprehensive survey of the enabling technologies, protocols, and architecture for IoT powered transport.

Keywords: Internet of things, Wireless Sensor Network(WSN) , IR sensor, Wireless data transmission, Radio frequency Identification, traffic symbol analysis, idle vehicle.

1. INTRODUCTION

The increases in number of vehicles have led to new problems in the aspect of transportation. Traditional traffic monitoring and control systems fail to meet the great demands of the current scenario. To handle such critical situations we use Artificial Intelligence algorithms with the support of IoT powered devices to monitor and take necessary actions. In particular, the rear-end collisions are a major problem in any highway. These occur majorly due to idle vehicles or vehicles that are parked at the leftmost lane. The misconception of drivers is the major cause for rear end collisions which stands 3rd in the index of accidents. There is no proper method to prevent or control such accidents. Almost every year 40% percentage accidents occur due to this. The proposed system reduces such accidents by continual vehicle monitoring. Another cause for accidents is the unawareness of traffic symbols. Out of 600 drivers 500 of them never mind the traffic symbols which not only cause accidents but may also end in fatal injuries and vehicular damage. All such defects in driving can be assisted by intelligent systems which assist in driving. The automation in transport has been approved by several countries and their governments. For example, Germany Federal Highway Research Institute And US National Traffic Safety Association promote 2-level automation, which allows the driver to analyse several driving and safety factors of the vehicle.

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Idle Vehicle Detection and Traffic Symbol Analysis using Artificial Intelligence and IoT

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ABSTRACT

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Data Analysis in Trade

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ABSTRACT

Data Warehousing is arisen in order to overcome the issues faced by the excel file. When several database is maintained by the excel file a conflict will arise such that which source file belongs to which excel sheet. In order to overcome the problem a data warehousing is used and a new technique used in data warehousing is soft concatenation mapping which depicts a relationship between column during transformation and concatenation .At that time many redundancy and loss of data may occur in order to overcome the issue an efficient method is used that is used to derive an approximate algorithm. This approximation is used both in real time and synthetic data sets.

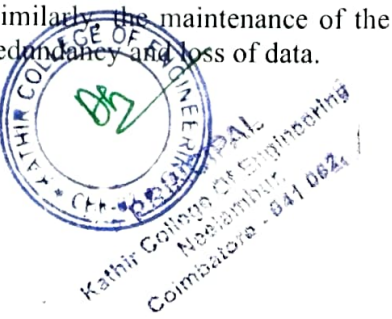
Keywords-Database management, data profiling, data integration, data analysis, Concatenation

1. INTRODUCTION

A Data Warehouse is a form of central repository which stores the data that are collected from various internal and external source file .Data Warehousing that emphasizes and capture the data for processing in an legitimate manner. Typically a Data Warehousing is a form of relational database which is mounted on an enterprise main framework. Dataset from various online transaction process and other online system they are selectively extracted in order for efficient analysis on Business activities ,for better decision support and also enhance the growth of easy analysis task. The process of collecting all the required data about the small or large scale organisation and storing in the central repository and by the use of data analysis task using the certain tools an enhanced analysis process can be taken out from the output of the data analysis an better decision can be taken out or that make an intimate for users as kind of awareness before proceeding the process.

1.1 EXISTING SYSTEM

The Data are stored in the form of excel where the searching process and their performance is very low. Since the data is stored in the form Excel sheets and Spreadsheet the data is information that is stored in any spreadsheet program such as Excel or Google Sheets or any other format. The Data stored in cells in a worksheet can be used in calculations, displayed in graphs, or sorted and filtered to find specific information. The maintenance of the Excel sheet for collection of storage of all amount data in an large database is that the performance is very low and issue will arise such that which data belongs to which data source .similarly the maintenance of the collection of huge data in the Excel sheet will result in an many redundancy and loss of data.



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Online Job and Candidate Recommendation System

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ABSTRACT

To develop an enhanced web application, using web services for both online job and candidate recommendation system. By using Professional Social Recommender (PSR) and Text field filtering the recommendation of jobs and candidates will be classified. Three tier architecture designs have been implemented for efficient data retrieval and data transfer. They are Job seeker interface, Candidate recruitment interface and Recommendation database will be the architecture taken for developing this application. The primary architecture will be the job seeker interface, in followed with candidate recruitment interface and Recommendation database will be interconnected. The professional social recommender will works as a third party agent and the agent will retrieves all the recommended job and candidate profiles. A panel will be designed for displaying the recommended job and candidate details. All the displayed jobs will be more relevant to the user's profile. The generated user and candidate profile will be encrypted in order to overcome the privacy breaches.

Keywords: Professional Social Recommender (PSR), online job, Candidate recommendation

1. INTRODUCTION

Generally, data mining (sometimes called data or knowledge discovery) is the process of analysing data from different perspectives and summarizing it into useful information - information that can be used to increase revenue, cuts costs, or both. Data mining software is one of a number of analytical tools for analysing data. It allows users to analyse data from many different dimensions or angles, categorize it, and summarize the relationships identified. Technically, data mining is the process of finding correlations or patterns among dozens of fields in large relational databases.

Data mining, the extraction of hidden predictive information from large databases, is a powerful new technology with great potential to help companies focus on the most important information in their data warehouses. Data mining tools predict future trends and behaviors, allowing businesses to make proactive, knowledge-driven decisions. The automated, prospective analyses offered by data mining move beyond the analyses of past events provided by retrospective tools typical of decision support systems. Data mining tools can answer business questions that traditionally were too time consuming to resolve. They scour databases for hidden patterns, finding predictive information that experts may miss because it lies outside their expectations.

Most companies already collect and reference massive quantities of data. Data mining techniques can be implemented rapidly on existing software and hardware platforms to enhance the value of existing information resources, and can be integrated with new products and systems as they are brought online. When implemented on high performance client/server or parallel

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Traffic Accident Evaluation using MATlab

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ABSTRACT

The main aim of this paper is to analyze the road traffic accidents in metro-politian city level at all intersection points. Analysis shows that the distribution of road accidental deaths and injuries in cities varies according to age, month and time. To develop the system that would avoid the accident by sending the notification whether the area is most traffic and there are so many accidents occurred in that place .The most accident precaution systems are available but those are not enough to users, so this new system may bring comfort zone to the users. Already know that high number of accidents is happened because of hightraffic at peak hours.Reason of traffic was no of vehicles are increased.so the main concept of the system has to be done using the no of vehicles at every zone. And we use some clustering methods to denote that which zone was in active and un-active state .The userwho travelling in the night that should be most useful for them.

Keywords: Traffic accidents, Clustering, Flash board, MATLAB, number of vehicles.

1. INTRODUCTION

Road accidents are higher in extreme weather and during working hours .The Analysis of road accident scenario at state and city level shows that there is a huge variation in fatality risk across states and cities. Fatality risk in 16 out of 35 states and union territories is higher than the all India .Although, burden of road accidents in India is marginally lower in its metropolitan cities, and almost 50% of the cities face higher fatality risk.In general, while in many developed and developing countries, road safety situation is generally improving, India faces a worsening situation. There is thus an urgent need to recognize the worsening situation in road deaths and injuries and to take appropriate action.We are developing the system that can be used to avoid the accidents in intersection of roads and major traffic areas .Using clustering methods, merging the all intersection the roads. For this system we develop a manual report of particular four zones.That report containing number of vehicles about north ,west ,east , and south.Using the report we have drawing the graph that showing the number of accidents occurred and number of vehicles in current location.From the graph which location has the high percentage of Accidents and vehicles at a time the Flash board that show the alert message to the drivers.

2. EXISTING SYSTEM

Previous works are contain only about traffic risks, high risky location and some precaution methods. Some works have collected the reasons of those accidents like drivers unawareness , inproper driving experience and their age. Other systems are tried to collect the fatality ,injury types and compare them using some classifiers. Several studies related to traffic data mining have

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Electronic Health Record System using Blockchain

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ABSTRACT

This paper deals with the Electronic Health Records for storing information of the patient which consist of the medical reports. Electronic Health Records (EHRs) are entirely controlled by Hospitals instead of patients, which complicates seeking medical advices from different hospitals. In the existing system of storing details of the patients are very dependent on the servers of the organization. In the proposed all the information of the patient are stored in the blockchain by using the Metamask and these details are stored in the block chain as a blocks of data. Each block consists of the data which is encrypted data. Electronic Health Record (EHR) systems record health-related information on an individual so that it can be consulted by clinicians or staff for patient care. The data is encrypted by the algorithm known as SHA-256 which is used to encrypt all the data of the patients into a single line 256 bit encrypted text which will be stored in the block at etherscan. These records for not only useful for the consultation but also for creation of historic family health information tree that keeps track of genetic health issues and diseases it can also be used for any health service with the authorization from both the patient and medical organization.

Keywords: Blockchain, SHA 256 algorithm, Encryption of data, Metamask.

1. INTRODUCTION

The objective of this project is to provide the application which is user friendly and cost effective. The major advantage of this project is security. A securable system is more important to be reliable. Electronic Health Records (EHRs) provide a convenient health record storage service, which promotes traditional patient medical records on paper to be electronically accessible on the web. This system was designed to allow patients to possess the control of generating, managing and sharing EHRs with family, friends, healthcare providers and other authorized data consumers. Moreover, provided that the healthcare researcher and providers of such service access these EHRs across-the aboard, the transition program of healthcare solution is expected to be achieved. However, in the current situation, patients scatter their EHRs across the different areas. During life events, causing the EHRs to move from one service provider database to another. Therefore, the patient may lose control of the existing healthcare data, while the service provider usually maintains the primary stewardship. Patient access permissions to EHRs are very limited, and patients are typically unable to easily share these data with researchers or providers.

Blockchain is a decentralized database whose data block is connected chronologically. In the healthcare industry, there are many different parties who need to collaboratively manage personal EHRs blockchain (in a model of consortium blockchain), such as medical specialists, hospitals, insurance departments, etc. Electronic Record Systems are proprietary that is centralized by

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Detaching and Reproducting of Data in a Cloud for Excellent Performance and Security

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ABSTRACT

Cloud computing is third party administrative control so our data is outsourced it gives rise to security concerns.security is one of the important aspect of any technology. Therefore high security measures are required to protect our data. In this paper, we propose Detaching and Reproducting of Data in a cloud for excellent performance and security that collectively approaches security issues and data sharing protectively. In this methodology, we divide the file into fragments and replicated over cloud nodes. Files are fragmented and shuffled like (1-2,2-3,3-4,4-1)in sequential order and stored in multiple servers. Moreover nodes sharing fragments are separated with certain distance by using T-colouring graph to prohibit an attacker by guessing the location of fragments. This methodology does not rely on traditional cryptography techniques.

Keywords: cloud security, fragmentation, replication, T-colouring graph, data splitting

1. INTRODUCTION

Cloud computing is one the top most technology in our world. Cloud computing is innovative technology that uses advanced computational power and enhancing storage capabilities. Cloud computing is mainly used for storage and management of information technology framework. Cloud computing are characterized by

- On-demand self-services
- Ubiquitous network accesses
- Resource pooling
- Elasticity
- Measured services.

Cloud security issues may stem due to the core technologies implementation (virtual machine (VM) escape, session riding, etc.), cloud service presenting (structured query language injection, weak authentication schemes, etc.), and arising from cloud computing characteristics (data recovery vulnerabilities, Internet protocol vulnerabilities, etc.). Some benefits of cloud are

- Minimum cost
- Negligible management
- Greater elasticity
- Cost savings

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Mathematical modeling and analysis of elastic waves in a thermo piezoelectric multilayered rotating composite rod with LEMV/CFRP interface

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[2] Kathir College of Engineering,Department of Mathematics,Coimbatore ,TamilNadu, India

Abstract: In this present paper, we form the mathematical model for wave propagation in a thermo piezoelectric multilay rotating composite rod made of inner and outer piezoelectric layer bonded together by Linear Elastic Materials with v (LEMV).To uncouple the equation of motion, electric and heat conduction equations, displacement potential functions introduced. The frequency equations are obtained for longitudinal and flexural modes of vibration and are studied numeric for heat conducting PZT-5A material.The computed non-dimensional frequency is presented in the form of dispersion cu against various physical quantities. Adhesive layer Linear Elastic Materials with Voids (LEMV) is compared with Carbon F Reinforced Polymer (CFRP).We found that the frequency wave characteristics are more stable and realistic in the presenc thermal, electrical and the rotation parameters

Keywords: Piezoelectric cylinder, Thermal cylinders, Rotating rod, Vibration, Stress analysis, LEMV, CFRP, multilay structures, Composite cylinder.

1 Introduction

Solid state materials in engineering is hovering to provide significant inputs to the areas of constructive design of struct components as well as creating trends of its own. The cross disciplinary fields of mechanical materials and interfacial compo are shows potential developments. Further interdisciplinary materials research will likely to continue to acquiesce materials v improved properties for application that is both common place and specialized. piezoelectric polymers allow their use in a mas amount of compositions and geometrical shapes for a huge variety of applications from transducers in acoustics, ultrasonics hydrophone applications to resonators in band pass filters, power supplies, delay lines, medical scans and some industrial n destructive testing instruments.The frequency responses of rotating cylindrical structures has numerous applications in a var of fields of science and technology, specifically, submarine structures, pressure vessel, bore wells, ship building industries have many other engineering applications.

Honarvar et al. (2007) developed a wave propagation model for a transversely isotropic cylinders and verified their phys characteristics. Thermo-piezoelectric materials are intelligent materials that display individual electro-mechanical couplin view of this, Paul and Raman (1991) studied wave propagation in a hollow pyroelectric circular cylinder of crystal c 6.Mindlin (1974)analyzed equations of high frequency vibrations of thermopiezoelectric crystal plates.Also Paul and Ra (1993) discussed wave propagation in a pyroelectric cylinder of arbitrary cross section with a circular cylindrical cavity.Storo (2013),investigated propagation of electro elastic waves in multilayer piezoelectric cylinders with a sector notch.Nelson Karthikeyan (2008a) discussed axisymmetric vibration of pyrocomposite solid cylinder.Nelson and Karthikeyan (2008b)stu axisymmetric vibration of pyrocomposite hollow cylinder.Shulga (2002) observed Propagation of harmonic waves in anisotr piezoelectric cylinders:Compound waveguides.Hua et al. (2013) observed guided wave propagation and focusing in multi-l pipe with viscoelastic coating and infinite soil media.Tasdemirci et al. (2004) discussed Stress wave propagation effects in two- three-layered composite materials.Singh and Saxena (1995) discussed axisymmetric vibration of a circular plate with double li variable thickness.Presented clear statement for modal shapes and natural frequencies of materials into account the effect length, shear deformation, and rotary inertia.Abd-Alla and Mahmoud (2010) observed magneto-thermoelastic problem in rota non homogeneous orthotropic hollow cylindrical under the hyperbolic heat conduction model.El-Naggar et al. (2002) discu thermal stresses in a rotating non-homogeneous orthotropic hollow cylinder.Abd-Alla et al. (2000) examined thermal stresses non-homogeneous orthotropic elastic multilayered cylinder.Abd-All et al. (1999) observed transient thermal stresses in a rota non-homogeneous cylindrically orthotropic composite tubes. Selvamani (2015) has discussed wave propagation in a rotating of polygonal cross-section immersed in an inviscid fluid.Several researches are performedto incorporate the interfacial materi analysis of composite multilayered mechanical structure.Among that, the study of Cowin and Nunziato (1983) with Linear Ela Materials with Voids as interface bonding materialis noted. However, the rotational effect on the thermo-electro-mechan

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An optimal low power digital controller for portable solar applications

Journal of Renewable and Sustainable Energy 10, 053702 (2018); https://doi.org/10.1063/1.5043500

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ABSTRACT

The design of controllers for solar energy harvesting systems plays the key role in deciding the efficiency of the energy utilized. In applications of energy scavenging, the harvested power is consumed for about 70% in the operation of the converter and controller blocks before being supplied to the load. The proposed optimal Field Programmable Gate Array based Load Predictive Maximum Power Point Tracking (LP_MPPT) Digital Controller is used for low power, speedy, and decisive energy scavenging systems for a long run in applications of wireless or remote sensing or portable. LP_MPPT helps to predict the need of the load and generate the converter output as buck/boost/buck_boost mode power in comparison to the input from solar panels for every clock cycle. The power consumption of the controller section is comparatively reduced as the buck_boost mode of operation utilizes the no operation state. The proposed methodology is simulated and implemented using Xilinx ISE Design Suite 12.1 which is supported by the family SPARTAN 3E. The simulation results thus obtained show an increase in efficiency (94.3%) with trade off factors, namely, speed and are

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CFD AND EXPERIMENTAL ANALYSIS OF SAVONIUS VERTICAL AXIS WIND TURBINE

T. Sivakumar, K. Sivakumar, B. Sivaraman, C. Sivan Raj and A. Kuppu Raj

Abstract

This paper presents the study of flow over Savonius Wind Turbine consisting two bladed and three bladed configurations and its performance. For this kind of wind turbine, axis of rotation is almost perpendicular to relative wind. Due to continuous variation of flow angle with respect to pitch angle, strong unsteady effects like flow separation, vortex shedding, etc., are observed, in order to evaluate the performance. Comparison and investigation are carried out to appraise the performance on two bladed Savonius Wind Turbine of with three bladed configurations through CFD Analysis. For this purpose, Two bladed VAWT (Vertical Axis Wind Turbine) and Three bladed VWAT are designed with Aspect Ratio (D/H) as one. Numerical Simulation using Ansys-Fluent is carried out to two bladed and three bladed configurations, which provides a lot of insight about three dimensional unsteady flow over it. It confirms the ability of numerical approach, to evaluate and compare the efficiency of VAWT against each other.It has been observed that two blades Savonius wind turbine is more efficient, it has higher power coefficient under the same condition than that of three blades Savonius wind turbine.

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EXPERIMENTAL INVESTIGATION OFWEAR PROPERTIES OF UNI-DIRECTIONAL JUTE / CARBON FIBER REINFORCED HYBRID POLYESTER COMPOSITE

Journal: Journal of the Balkan Tribological Association 24 (3) (2018) Pages: 507 - 520

▼ Authors

RAVI KUMAR, P.; GIRIRAJ, B.; SENTHIL KUMAR, AP

▼ Abstract

Hybrid polymer composites are widely used in many engineering applications such as construction, automotive and aviation due to their superior properties. In the present experimental study, hand-layup followed by compression molding process were used to fabricate the Unidirectional jute / carbon fiber reinforced polyester composites (UDJCFRPC) in three different (10, 20 and 30) wt (\%) in the polyester matrix. Wear tests under dry sliding condition were conducted with the sliding velocity in the range of 2.62 - 4.7 m / s and with the loads in the range of 20 - 60N. Wear tests were conducted using Pin-on-Disc apparatus (PoD) and to optimize the combination of fiber weight fraction, sliding velocity and load conditions for relevant applications, Box Behnken (BB) method of Response Surface Methodology (RSM) of Design of Experiments was used. It was observed that Coefficient of Friction (COF) decreases with the increase in load and wear increases with the increase in the load of the composites. Frictional Force was found to be increasing with the increase in the load. The morphology of wear composite specimens has been examined by scanning electron microscopy (SEM) to understand the wear mechanisms.

▼ Keywords

▼ Cite this article

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Design and analysis of a portable friction stir welding machine

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Abstract

Friction stir welding is a mechanism to combine two solid metals without melting. This technique is much preferred for its flexibility, energy efficient, and also environment friendly as it results in high quality welding with low shrinkage. But these machines are giant and also consume more power. In order to address this problem, a portable friction stir welding machine has been designed and analysed. In this study, a machine has been designed to weld plates of 2mm thickness at low power consumption. This could be very much beneficial for the onsite welding processes and also to weld materials of less thickness. The design was done in four stages and the fourth stage was finally analysed for 2 tonne load and the plots are also shown in results and discussion for stress, displacement, strain and factor of safety. The analysis of overall factor of safety of the portable friction stir welding machine shows that all the components are safe except the transverse drive with a Factor of safety 1.431e-001 which is considered to be safe because the applied load is double to that of the required load. The Structural static analysis also was successfully completed using Solid Works by applying 2 tonne load and the results of various parameters such as stress, displacement, strain were plotted and tabulated.

Selection and/or Peer-review under responsibility of Materials Processing and characterization.

Keywords: Portable FSW machine; Stress and strain analysis; 2mm plate;

1. Introduction

Friction stir welding is a solid state welding process that is used to join metals like aluminium, nickel, titanium etc, just by the heat that is produced by the rotating tool[1]. This welding was invented by W.Thomas and E Nicholas at The Welding Institute in UK at 1991[1,2]. The term friction welding has been existing for more than 100 years and it is commonly used for joining rod or pipe shaped materials.

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IMME17

CHARACTERISATION OF ALUMINUM METAL MATRIX COMPOSITES AND EVALUATION OF THERMAL PROPERTIES

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Abstract

Aluminium Metal Matrix Composite (AMMC) to minimise defects usually associated in stir casting for materials during experimental evaluation. SiC and Flyash were added in the composites in varying levels of 6%, 12% & 18%. Specimens were stir cast in six different compositions. The chosen matrix material was LM 30 which is a popular light aluminium alloy used for casting small sized automobile engine cylinders. The elastic modulus and hardness of the AMMC was found to be increasing to a certain level of the content of the SiC in the composite and then found to be decreasing. Thermal characteristics are studied in detail to determine the properties. Thermal property analysis will be useful for the fix the exact design parameters to develop the product and to check the dimensions range for further analysis.

Selection and/or Peer-review under responsibility of International Conference on Emerging Trends in Materials and Manufacturing Engineering (IMME17).

Keywords: Aluminium Metal Matrix Composite(AMMC), Stir casting, SiC, Flyash ,thermal coductivity, k value

1. Introduction:

To overcome the problems faced in conventional materials, studies are going on to replace them with alloys/composites. Aluminium materials are found to be the best alternative with its characteristics like high strength to weight ratio low density and low cost. In this study lightweight Aluminium based material LM30 is used to prepare composites with silicon carbide and fly ash as reinforcements. Fly ash is one of the inexpensive and low

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STUDY OF MECHANICAL PROPERTIES OF JUTE/CARBON FIBER REINFORCED POLYMER HYBRID COMPOSITES FOR AUTOMOTIVE APPLICATIONS

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▼ Authors

KUMAR, R., GIRIRAJ, B., KUMAR, S., SURESH, A. R.

▼ Abstract

High strength to weight ratio is an important criteria in aerospace and automobile applications for performance. The lightweight structure that uses a novel design and advanced materials is one of the keys to improve the fuel efficiency and re- duction of the environmental issues of automotive vehicles. Carbon fiber rein- forced polymer matrix composite (CFRPMC) materials are being used in such ap- plications for manufacturing structural components due to their light weight and high strength. To reduce the cost of CFRPMC, hybrid Jute/Carbon (JC) fiber rein- forced polymer composite materials (HJCFRPMC) are processed and mechanical characterization was done to find tensile, flexural, impact, water absorption and the fatigue properties of composites are studied in this work. The composites are fabricated up to a maximal weight fraction of fiber 30{\%} by hand layup method and followed by compression moulding process. It has been found out that there is significant improvement in tensile strength, tensile modulus, flexural strength, flexural modulus, impact strength and fatigue strength by 56{\%}, 50{\%}, 41{\%}, 47{\%},113{\%} and 41{\%} respectively in HJCFRPMC. The fractography analysis of the frac- tured test specimens has also been carried using Scanning Electron Microscopy (SEM).

▼ Keywords

▼ Cite this article

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Investigations on Deep Cryogenically Treated Low Alloy Steel Impregnated with WS_2

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Abstract

The effect of 'Deep Cryogenic Treatment' (DCT) on the Powder Metallurgy processed Low Alloy (PMLA) steel impregnated with solid lubricant WS_2 in four different weight proportions (0, 2.5, 5 and 10%) was investigated. Precipitation of Ni was observed after DCT in PMLA steel impregnated with 0% WS_2. Finer needle-like martensitic regions, marginal precipitation of carbides and uniformly-distributed precipitation of Ni in the micro-structure and improved wear resistance were seen after DCT in PMLA steel with 2.5% WS_2. Higher porosity was found to be detrimental to dry sliding in PMLA steel impregnated with 5 and 10% WS_2.

Selection and/or Peer-review under responsibility of International Conference on Emerging Trends in Materials and Manufacturing Engineering (IMME17).

Keywords. Deep cryogenic treatment; Powder metallurgy; Low alloy steel; Solid lubricant; Wear resistance;

1. Introduction

Wear resistant materials and suitable material combination for the sliding pair are of great interest to engineers and researchers. Materials used in sliding applications undergo demanding service conditions with multiple complex environmental factors due to the effects of mechanical, thermal, chemical including tribological loading. Recently, extensive research works are reported showing the effect of low temperature (cryogenic) treatment on the performance of materials. The low temperature treatment, down to -196°C with liquid nitrogen is known as 'Deep Cryogenic Treatment' (DCT). Usually, cryogenic treatment is used as a supplementary heat treatment process and

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EXISTENCE OF SOLUTIONS OF DOUBLE PERTURBED IMPULSIVE NEUTRAL FUNCTIONAL INTEGRODIFFERENTIAL EQUATIONS

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Abstract: In this paper, we establish a set of sufficient conditions for the Existence of solutions for double perturbed impulsive neutral functional integrodifferential equations of the form

$$\frac{d}{dt}\big(x(t) - h(t, x_t)\big) = A(t)x(t) + F\left(t, x_t, \int_0^t a(t,s)K_1\big(s, x_\tau, g_1(x_\tau)\big)d\tau\right) + G\left(t, x_t, \int_0^t b(t,s)K_2\big(s, x_\tau, g_2(x_\tau)\big)d\tau\right)$$

$$x_0 = \varphi \in B,$$

$$\Delta x(t_i) = I_i\big(x(t_i)\big), \quad i = 1,2,\dots,n, \quad a.e.\, t \in J = [0,a],$$

The results are established by using semigroup theory and Schauder fixed point theorem.

Keywords: Integrodifferential equation, Semigroup theory, Fixed point theorem, Equicontinuous, Banach space.

1. INTRODUCTION

In recent years, the theory of impulsive differential equations has become an important area of investigation stimulated by their numerous applications to problems arising in mechanics, electrical engineering, medicine, biology, ecology, etc,. Relative to this matter, we refer the reader to Bainov and Simeonov[5], Rogovchenko [30, 31]. For other contributions on the impulsive problems see [2, 16]. Dong [19, 20, 18], Guedda [22], Bans [11], Runping [32, 33] and Xue [36] studied some functional differential equations under the conditions in respect of the measure of noncompactness.

Neutral integrodifferential equations arise in many areas of applied mathematics and for this reason these equations have received much attention in the last decades. The literature relative to ordinary and partial neutral functional differential equations is very extensive and we refer the reader to [3, 7, 8, 10, 14, 15] and the references therein.

Recently Selma Baghli et al. [4] studied the existence of mild solutions of partial perturbed evolution equation with infinite delay in Frechet spaces described in the form

$$y'(t) = A(t)y(t) + f(t, y_t) + g(t, y_t), \quad a.e.\, t \in J = [0,\infty),$$

$y_0 = \varphi \in B,$

Advanced Representations of Graph Theory in Engineering Systems

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Abstract— The discrete mathematical representations of graph theory, augmented by theorems of Metroid theory, were found to have elements and structures isomorphic with those of many different engineering systems. The properties of the mathematical elements of those graphs and the relations between them are then equivalent to knowledge about the engineering system, and are hence termed "embedded knowledge". The use of this embedded knowledge is illustrated by several examples: a structural truss, a gear wheel system, a mass-spring-dashpot system and a mechanism. Using various graph representations and the theorems and algorithms embedded within them, provides a fruitful source of representations which can form a basis upon which to extend formal theories of reformulation.

Keywords— Graph theory, Isomorphic structures, Flow graph representation, Knowledge representation, Metroid theory

I. INTRODUCTION

When a human analyses or synthesizes an engineering system by using the mathematical representation governing its behavior, he or she creates a mathematical model of the engineering system, and then manipulates the equations using knowledge about them and their relation with the physical reality. In usual engineering practice, one uses a model that is known to be suitable for the system at hand and the aim of the computation. Reformulation of the problem into another formally understood mathematical system [1,2] to the extent that it is done for engineering analysis, usually uses continuum mathematics. This paper shows that representations of graph theory for engineering problems can be useful as a basis upon which to extend formal theories of reformulation.

Research in engineering analysis usually starts with an understanding of the physical system, then the adoption of a suitable mathematical model for the system. In the work reported here a different approach was adopted. Rather than starting with the physical system itself or the mathematical representations historically used for the behavior of engineering systems, many other mathematical approaches were investigated to find those which can be useful representations of engineering systems. Representations were sought for which knowledge of the mathematical properties of those representations and the relations between them can be used to provide augmented understanding of the physical engineering system.

Graph theory is a useful representation because on the one hand the elements of the graph can be defined so as to have a one-to-one correspondence with the elements of many kinds of engineering systems. On the other hand, the theorems and algorithms of graph theory allow one also to represent behavioral properties of the system, such as deformations and forces, or velocities and movements, as properties of the vertices or edges of the graph.

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$\psi\hat{g}$ -CLOSED SETS IN BIˇCECH CLOSURE SPACES

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Abstract

In this paper, we introduce the concepts of $\psi\hat{g}$ -closed (resp. $\psi\hat{g}$ - open) sets in bi ˇ Cech closure space and some characterizations and properties are investigated. Further, the concept of ${}_{\psi\hat{g}}C_0$ bi ˇ Cech spaces and ${}_{\psi\hat{g}}C_1$ bi-ˇCech spaces are introduced and their basic properties are studied.

Keywords: biˇCech closure operator, biˇCech closure spaces, biˇCech- $\psi\hat{g}$ - closed sets, biˇCech- $\psi\hat{g}$ - open sets, $\psi\hat{g}$ C_0 biˇCech spaces and $\psi\hat{g}$ C_1 bi-ˇCech spaces

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Introduction

ˇCech closure spaces were introduced by ˇCech [1] and then studied by many authors, see e.g. [2,2,5,7]. In ˇCech's approach operator satisfies idempotent condition among Kuratowski axioms. This condition need not hold for every set A of x when this condition is also true, the operator becomes topological closure operator. Thus the concept of closure space is the generalization of a topological space. Ramya and Parvathi [7] introduced the concept of $\psi\hat{g}$ -closed set in topological spaces and to investigate some topological properties. This paper deals with the concept of biˇCech - $\psi\hat{g}$ - closed sets, $\psi\hat{g}$ C_0 bi-ˇCech spaces and $\psi\hat{g}$ C_1 bi- ˇ Cech spaces in bi-ˇCech closure spaces and some of their properties.

2. Preliminaries

Definition 2.1. Two functions k_1 and k_2 from power set of X to itself

are called bi- ˇ Cech closure operators (simply biclosure operator) for X if they satisfy the following properties.

(i) $k_1(\phi) = \phi$ and $k_2(\phi) = \phi$

(ii) $A \subset k_1(A)$ and $A \subset k_2(A)$ for any set $A \subset X$

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Vibration of thermo lemv composite multilayered hollow pipes

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Abstract. The present paper is concerned the effects of thermo elastic waves in a composite multilayered hollow pipes which contain inner and outer zinc layers bonded by Linear Elastic Material with Voids (LEMV) is considered.The equation of movement is derived by means of the constitutive equations of linear thermo elasticity.The equation of movement and heat conduction models are decoupled by the displacement of potentials which are constructed based on equilibrium equations of elasticity.The dispersion equation are acquired by means of traction free boundary conditions and are numerically analyzed for Zinc material.The enumerated frequency,phase velocity are presented graphically for LEMV and CFRP layers.

1. Introduction

The thermo pliant material contains various utilization in many extent of science,Engineering and Technology, by the propagation of waves namely study of modern engineering, thermal power station, sub marine framework, pressure thin and thick shells vessels,aircraft,oil and gas pipes and metallurgy.To replace components with classical materials such as, steel and concrete made by fiber reinforced materials.There are many attempts in engineering fields to use composites typically for the light-weight structures,on the modeling and analysis of multilayered composite.

Denos Gazis[1] investigated three dimensional wave propagation in hollow circular cylinders.Jinyoung so and Leissa[2] discussed the free vibrations of thick hollow circular cylinders from three-dimensional analysis.Farhang Honarvar[3] analyzed the wave propagation in transversely isotropic cylinders.Chau[4] studied about the vibrations of transversely isotropic finite circular cylinders.Farhang Honarvar et al.[5] carried out the results for asymmetric and axisymmetric vibrations of finite transversely isotropic circular cylinders.JaiLue Lai et al.[6] studied Propagation of harmonic waves in a composite elastic cylinder.Xi et al.[7] developed the study of dispersion of waves in immersed laminated composite hollow cylinders.Paul and Nelson [8] derived the frequency of equation and numerical solution for asymmetric vibration of piezoelectric composite cylinders.Nelson and Karthikeyan [9] analyzed the axisymmetric vibration of pyro composite hollow cylinders.Haines and Lee [10] carried out approximate theory of torsional wave propagation in elastic circular composite cylinders. Green and Lindsay [11] obtained an explicit version of the constitutive equations.Gei, Bigoni and Franceschin [12] studied the results for propagation of thermoelastic waves in layered structures.Erbay and Suhubi [13] discussed about longitudinal wave propagation in a generalized thermoelastic cylinder.They revealed that the elastic behavior dominates in mechanical and thermal modes.EliLeinov et al. [14, 15] investigated guided wave propagation and attenuation in pipe buried in sand and guided wave propagation in pipes fully and partially embedded in concrete.

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Carbon Nanotubes from Plant Derived Hydrocarbon - An Efficient Renewable Precursor

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Abstract

The present work aspire to explore cost effective a natural renewable Eco-friendly green precursor for the synthesis of Multi-walled carbon nanotubes (MWCNTs) using methyl ester of Moringa oleifera oil over Fe-Co impregnated Alumina support at 650 °C under N_2 atmosphere. The characterization of the as-grown carbon materials were analyzed by Scanning electron microscopy (SEM), High resolution transmission electron microscopy (HRTEM), XRD and Raman spectroscopic analysis. The bimetallic catalyst of Co and Fe supported on alumina gel particles improves the quality and uniformity in diameters of CNTs. The diameters of as-synthesized nanotubes are in the range of 19 nm to 22 nm

Keywords: *Carbon nanotubes; Moringa oleifera oil; Raman & XRD spectroscopic analysis; Spray-pyrolysis; SEM.*

1. INTRODUCTION

Carbon nanotubes (CNTs) are now well into their teenage years. Earlier on, theoretical predictions and various experimental evidence showed that CNTs possess chemical and physical properties that surpass those of many other nanosized materials. This has activated intense research into CNTs world wide. The vital publication of Iijima (Iijima, 1991) made carbon nanotubes (CNTs) one of the key component in nanoscience and technology. as the numerous new applications are being proposed, so is the rapid rise in demand for its large production. This is due season to explore new environment friendly natural renewable precursors.

In general, CNTs are synthesized by arc discharge, laser ablation, and CVD or spray Pyrolysis. Among these methods CVD or spray pyrolysis method is regarded as a promising method to synthesize carbon nanotubes (CNTs) because of its benefits to achieve a high yield of CNTs and can be easily scaled up for the production of CNTs at a relatively low cost (Karthikeyan *et al.* 2008). Several papers have been published and describe a simple routine for synthesizing low-cost CNT arrays in large scale from petroleum-based precursors such as benzene, xylene and hexane (Sadeghian *et al.* 2009). These carbon precursors are related to fossil fuels and there may be a crisis for these precursors in the near future. There are few reports on the synthesis of CNTs from plant based precursors such as camphor (Kumar *et al.* 2003), turpentine oil (Afre *et al.* 2005), eucalyptus oil (Ghosh *et al.* 2007), palm oil (Suriani *et al.* 2009), neem oil (Kumar *et al.* 2011), coconut oil (Paul *et al.* 2011), pine oil (Karthikeyan *et al.* 2008), and reports from plant derived methyl esters *Oryza sativa oil* (Kalaiselvan *et al.* 2015; 2016), *Cymbopogen flexuosus* oil (Mageswari *et al.* 2014), *Helianthus annuus* oil (Angulakshmi *et al.* 2012; 2013), *Glycine Max* Oil (Angulakshmi *et al.* 2013), *Madhuca Longifolia* Oil (Kalaiselvan *et al.* 2013 ; 2014) and *Brassica Juncea* Oil (Kalaiselvan *et al.* 2014 ; 2016). The advantages of the plant derived carbon precursor are that it is a renewable biomaterial, and abundantly available and owing to these two factors, it has a huge potential to be used as the carbon source for the synthesis of CNTs, and therefore, the resulting product can be commercialized at a lower cost (Kalaiselvan *et al.* 2014).

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Application of Box Behnken design to Optimize the Reaction Conditions on the Synthesis of Multiwalled Carbon Nanotubes

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Abstract

This paper describes the use of Box Behnken design approach to plan the experiments for turning the yield of Multiwalled Carbon nanotubes (MWCNTs) synthesis by spray pyrolysis method using Citrus limonum oil as carbon precursor and Fe/Co supported on silica as catalyst. Reaction temperature, composition of catalyst and feed rate of precursor were the chosen parameters to optimize the process. A total of 17 runs were required to achieve the optimum conditions. Characterization of as grown CNTs were done by scanning electron microscopy, Transmission electron microscopy and Raman Spectroscopy. This work resulted in identifying the optimized set of turning parameters for spray pyrolysis to achieve high yield of CNTs.

Keywords: *Box-Behnken design, Carbon nanotube, Spray pyrolysis.*

1. INTRODUCTION

Carbon nanotubes are members of the fullerene structural family that was discovered by Iijima in 1991(Iijima, 1991). These incredible structures have enthralling mechanic, electronic and magnetic properties (Langer *et al.* 1996; Yu *et al.* 2000; Dressel Haus *et al.* 2001). These peculiar properties makes the material potentially applied in solar cells, nanoelectronic devices, field emitters, gas storage, biosensors and as catalyst supports (Suzuki *et al.* 2003; Brattas *et al.* 2008; Yoon *et al.* 2005; Dillon *et al.* 1997; Oh *et al.* 2009 ; Pan *et al.* 2006). There are several methods for synthesis of CNTs, most widely used among them are Arc discharge, Laser ablation, Chemical vapour deposition and spray pyrolysis method (Song *et al.* 2007, Guo *et al.* 1995; Suriani *et al.* 2009; Ghosh *et al.* 2007; Kalaiselvan *et al.* 2014). Spray pyrolysis is similar to CVD and the only difference it is a single step process, whereas in CVD it is two step processes (Kalaiselvan *et al.* 2013; 2016). Catalysts such as Fe, Co or Ni catalysts were widely used for the synthesis of singlewalled and multiwalled CNTs (Kalaiselvan *et al.* 2016). Synergetic effect of the metals involved in the catalyst found to enhance the catalyst activity (Ghosh *et al.* 2008). Li *et al.* have studied the effect of temperature on growth and structure of carbon nanotubes (Li *et al.* 2002). Natural hydrocarbons have been utilized as carbon precursor for the synthesis of CNTs such as camphor, turpentine oil, pine oil, *Cymbopogen flexuous* oil and *Helianthus annuus* oil (Afre *et al.* 2006; Kumar *et al.* 2007; Karthikeyan *et al.* 2010; Mageswari *et al.* 2014; Angulakshmi *et al.* 2013). These natural precursors are very cheap, renewable and ample of its availability. Recently, process optimization with the aid of design of experiments is rapidly gaining popularity in various field related to nanotechnology. Nourbakhsh studied the effect of process parameters on the diameter of carbon nanotubes utilizing RSM (Nourbakhsh *et al.* 2007). Statistical design of experiment is the science of statistically analyzing the largest possible amount of information with the smallest number of experiments (Goh *et al.* 2001). Liu etal., optimized the reaction conditions for the synthesis of single-walled carbon nanotubes using reponse surface methodology (Liu *et al.* 2012). Box-Behnken designs were introduced in order to reduce the sample size as the number of parameters grows. Box-Behnken is based on a spherical, revolving design. It has been applied for the

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Hardware Implementation of Bidirectional Full Bridge Isolated DC- DC Converter

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Abstract — **This paper presents the design and development of an ultra-high efficiency bidirectional isolated full bridge DC-DC converter. To achieve ultra-high efficiency, synchronous rectification and high efficiency magnetics are used. The proposed bidirectional converter allows a power flow in both directions using the same power components; this increases power density and reduce the cost. The converter operates at a switching frequency of 50 kHz with a voltage of 130 volts at one side and 52 volts at the other side of the converter. The fast switching speeds of the switching devices are utilized to achieve extremely high conversion efficiency thus reducing the total volume of the converter. The high power DC-DC converter has attained an extremely high efficiency of 80% in both the directions. The performance of a 1.7 kW bidirectional converter is validated in both forward direction (buck mode) and backward direction (boost mode) using MATLAB simulation.**

Keywords— ***DC-DC Converter, Switching Device, buck mode, high efficiency, switching speeds.***

I. INTRODUCTION

Bidirectional DC-DC converters are used in applications where bidirectional power flow may be required. In Hybrid Electric Vehicles (HEVs) and Electric Vehicles (EVs), these bidirectional converters charge a low voltage (12 V) battery during normal operation (buck mode) and charge or assist the high-voltage (400V/600V) battery or bus in emergency situations like when a high-voltage battery has discharged to a very low energy or capacity level (boost mode). A typical system consists of a full-bridge power stage on the High-Voltage (HV) side, which is isolated from a full-bridge or a current-fed push-pull stage on the Low Voltage (LV) side.

The world's rapidly expanding population and increasing levels of consumerism have given rise to significant environmental issues that must be confronted. Firstly, there is a great reliance on fossil fuels to provide energy, of which a large part is consumed by transportation systems. While shale oil recovery by the hydraulic fracturing process has provided a temporary increase in production, it is only extending the point in time at which demand exceeds supply.

The second, and interrelated, major problem is that of environmental damage in general, and specifically that of air pollution. Aside from the contentious issue of global warming, there is a requirement for a reduction in the burning of hydrocarbons to achieve adequate air quality. The basis for a solution to both problems is in the sustainable use of resources, and considerable effort is being expended investigating forms of renewable, or green, energy [Kaminski.N, 2009]. Two of the more promising alternative energy sources are from wind and solar farms.

These allow for distributed and localized generation, which offers the advantages of reduced distribution costs and improved network security. However, the supply of energy from these sources is variable in nature, due to the dependency on the weather conditions, and results in grid planning and stability issues. Furthermore, the problems caused by these source variations are exacerbated by the wide variations in electrical energy demand, even on an hourly basis within modern societies. Electric vehicles (EVs) are a part of the solution to the energy problem

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This paper presents a novel bi-directional isolated DC-DC converter which may be used in the V2G or DG applications discussed above. It has hardware that is similar to that of a Conventional Dual Active Bridge Converter (CDAB), except that the latter's inductor is replaced with a resonant network to reduce the converter's conduction losses.

II. BIDIRECTIONAL DC-DC CONVERTER

A PSFB converter consists of four power electronic switches (like MOSFETs or IGBTs) that form a full bridge on the primary side of the isolation transformer and diode rectifiers or MOSFET switches for Synchronous Rectification (SR) on the secondary side. This topology let's all the switching devices to switch with Zero-Voltage Switching (ZVS), resulting in lower switching losses and an efficient converter.

For such an isolated topology, signal rectification is required on the secondary side. For systems with low output voltage and/or high-output current ratings, implementing synchronous rectification achieves the best performance by avoiding diode rectification losses. In this work, synchronous rectification is implemented on the secondary side with various switching schemes to achieve optimum performance under varying load conditions. The circuit

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Hardware Implementation of Bidirectional Full Bridge Isolated DC- DC Converter

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Abstract — **This paper presents the design and development of an ultra-high efficiency bidirectional isolated full bridge DC-DC converter. To achieve ultra-high efficiency, synchronous rectification and high efficiency magnetics are used. The proposed bidirectional converter allows a power flow in both directions using the same power components; this increases power density and reduce the cost. The converter operates at a switching frequency of 50 kHz with a voltage of 130 volts at one side and 52 volts at the other side of the converter. The fast switching speeds of the switching devices are utilized to achieve extremely high conversion efficiency thus reducing the total volume of the converter. The high power DC-DC converter has attained an extremely high efficiency of 80% in both the directions. The performance of a 1.7 kW bidirectional converter is validated in both forward direction (buck mode) and backward direction (boost mode) using MATLAB simulation.**

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FPGA BASED BL-CSC CONVERTER-FED BLDC MOTOR DRIVE WITH POWER FACTOR CORRECTION

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Abstract — **This paper presents a Power Factor Correction (PFC) based Bridge Less Canonical Switching Cell (BL-CSC) converter-fed Brushless DC (BLDC) motor drive. The BL-CSC converter operating in a discontinuous inductor current mode is used to achieve a 0.99 power factor at the AC mains. The speed of the BLDC motor is controlled by varying the DC bus voltage using PI controller, where proportional and integral gains were tuned by conventional method. In order to reduce the switching losses of BLDC motor electronic commutation, Voltage Source Inverter (VSI) operates at fundamental frequency. Moreover, the bridgeless configuration of CSC converter offers low conduction losses due to partial elimination of diode bridge rectifier at the front end. The proposed configuration shows a considerable increase in efficiency.**

Keywords— *BLDC Motor, VSI, CSC, BL-CSC, sensor-less, diode bridge rectifier.*

I. INTRODUCTION

Brushless DC (BLDC) motors are recommended for many low- and medium-power drives applications because of their high efficiency, high flux density per unit volume, low maintenance requirement, low Electromagnetic Interference (EMI) problems, high ruggedness, and a wide range of speed control. Due to these advantages, they find applications in numerous areas such as household application transportation (hybrid vehicle) aerospace heating, ventilation and air conditioning, motion control and robotics renewable energy applications etc.

The BLDC motor is a three-phase synchronous motor consisting of a stator having a three-phase concentrated windings and a rotor having permanent magnets. It does not have mechanical brushes and commutator assembly; hence, wear and tear of the brushes and sparking issues as in case of conventional DC machines are eliminated in BLDC motor and thus it has low EMI problems.

Conventional scheme of BLDC drive fed by an uncontrolled rectifier and a DC link capacitor followed by a three phase Pulse Width Modulation (PWM)-based VSI is used for feeding the BLDC. This type of scheme draws peaky, harmonic rich current from the supply and leads to a high value of Total Harmonic Distortion (THD) of supply current and very low power factor at AC mains. A very high THD of supply current and very poor power factor of 0.72 is achieved which is not acceptable by IEC 61000-3-2.

These switching losses are reduced by using a concept of variable DC-link voltage for speed control of BLDC motor. This utilizes the VSI to operate in low frequency switching required for electronic communication of BLDC motor, hence reduces the switching losses associated with it The front end SEPIC AND CUK converter feeding BLDC motor using a variable voltage control have proposed in and but at the cost of two current sensors.

This paper presents the development of a reduced sensor –based BLDC motor drive for low power application. This motor is also referred as an electronically commutated motor since an electronic commutation based on the Hall-effect rotor position signals is used rather than a mechanical commutation.

These types of PQ indices cannot comply with the international PQ standards such as IEC 61000-3-2. Hence, single-phase Power Factor Correction (PFC) converters are used to attain a unity PF at AC mains these converters have gained attention due to single-stage requirement for DC-link voltage control with unity PF at AC mains.

Selection of operating mode of the front-end converter is a tradeoff between the allowed stresses on PFC switch and cost of the overall system. Continuous Conduction Mode (CCM) and Discontinuous Conduction Mode (DCM) are the two different modes of operation in which a front-end converter is designed to operate. A voltage follower approach is one of the control techniques which are used for a PFC converter operating in the DCM.

This is BL-CSC converter designed to operate in Discontinuous Inductor Current Mode (DICM) Such that the current flowing through inductor l1 & l2 are discontinuous, whereas the voltage across the Intermediate capacitors C1& C2 remains continuous in a switching period. An approach of variable DC link voltage for controlling the speed of the BLDC motor is used and it electronically commutated for reduced switching losses in the VSI. DC Link voltage control done with PI control and

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DECENTRALIZED VOTING SYSTEM USING ETHEREUM BLOCKCHAIN

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ABSTRACT:

Electronic voting systems are proprietary, that is centralised by design. This means that, there's a single supplier that controls the code base, database and the system outputs and supplies the monitoring tools at the same time. It is difficult for centralised systems to gain trust from voters and election organisers. Open source, independently verifiable systems solves this issue. Voters can vote freely without even visiting the poll, also they can verify their own votes. All votes are recorded publicly on the Ethereum Blockchain and can be viewed and audited by anyone. This kind of decentralised voting systems are significantly advanced and are secure enough to prevent attacks like Man in the Middle, DDoS, eavesdropping etc. and no vote can be manipulated by intruders. Since the system is decentralised, there is no single point of failure. And, this also prevents the web pages from disappearing leaving us with 404 not found error. Though this is more advanced than the traditional system of voting, this does not completely replace the voting polls but can provide a much needed complementary voting method.

I INTRODUCTION

Bitcoin demonstrated that through the power of the default consensus mechanisms and voluntary respect of the social contract it's possible to enhance our preferred network to make the decentralised application of value-transfer system. Democracy providing an immutable, verifiable and secure online voting system to leverage the availability of blockchain as a secure transaction database. From this public ledger, voters will be able to independently audit the inclusion of their vote and the outcome of the election as a whole, while being sure that the results cannot be changed due to immutability of the blockchain.

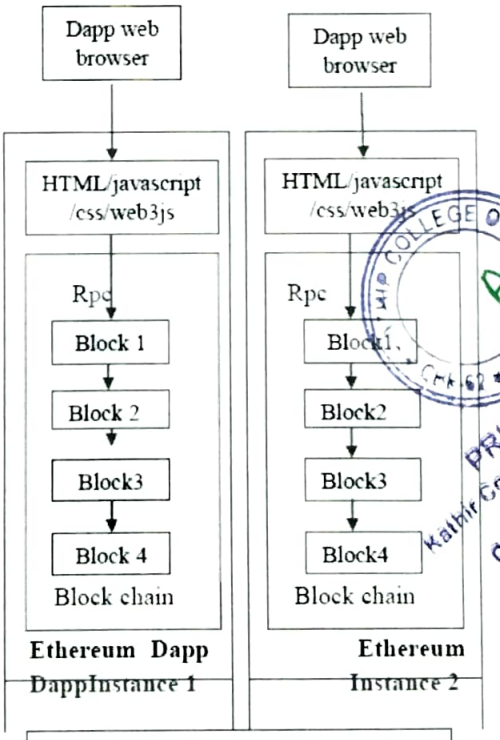

Fig 1: Working of Ethereum Dapp

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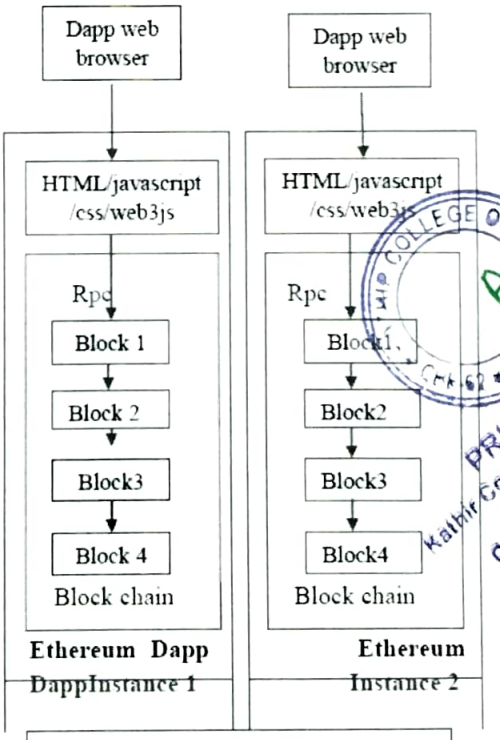

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IMPLEMENTING INTELLIGENT TRAFFIC CONTROL SYSTEM FOR AMBULANCE CLEARANCE USING RFID

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Abstract

The proposed system presents an intelligent traffic control system to pass emergency vehicles without hassle. Vehicles are equipped with special radio frequency identification (RFID) tag, which cannot be removed or destroyed. We use RFID reader, Arduino and PIC16F877A system-on-chip to read the RFID tags attached to the vehicle. It determines the network congestion, and hence the green light duration for that path is adjusted. When an ambulance is approaching the junction, it will communicate to the traffic controller in the junction to turn ON the green light. This module uses ZigBee modules on CC2500 and PIC16F877A system-on-chip for wireless communications between the ambulance and traffic controller. The prototype was tested under different combinations of inputs in our wireless communication laboratory and experimental results were found as expected.

Index Term: *ZigBee, CC2500, GSM, SIM300, PIC16F877A, ambulance vehicle, stolen vehicle, congestion control, traffic junction.*

I. INTRODUCTION

INDIA is the second most populous Country in the World and is a fast growing economy. It is seeing terrible road congestion problems in its cities. Infrastructure growth is slow as compared to the growth in number of vehicles, due to space and cost constraints [1]. Also, Indian traffic is non-lane based and chaotic. It needs a traffic control solutions, which are different from the developed Countries. Intelligent management of traffic flows can reduce the negative impact of congestion. In recent years, wireless networks are widely used in the road transport as they provide more cost effective options . Technologies like ZigBee, RFID and GSM can be used in traffic control to provide cost effective solutions. RFID is a wireless technology that uses radio frequency electromagnetic energy to carry information between the RFID tag and RFID reader. Some RFID systems will only work within the range inches or centimeters, while others may work for 100 meters (300 feet) or more. The ZigBee operates at low-power and can be used at all the levels of work configurations to perform predefined tasks. It operates in ISM bands (868 MHz in Europe, 915 MHz in USA and Australia, 2.4 GHz in rest of the world). Data transmission rates vary from 20 Kilobits/second in the 868 MHz frequency band to 250 Kilobits/second in the 2.4 GHz frequency band . The ZigBee uses 11 channels in case of 868/915 MHz radio frequency and 16 channels in case of 2.4 GHz radio frequency. It also uses 2 channel configurations, CSMA/CA and slotted CSMA/CA [5]. The whole paper is grouped into 5 parts. Sections II talks about the literature survey. Section III discusses about the current problems that

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Index Term: *ZigBee, CC2500, GSM, SIM300, PIC16F877A, ambulance vehicle, stolen vehicle, congestion control, traffic junction.*

I. INTRODUCTION

INDIA is the second most populous Country in the World and is a fast growing economy. It is seeing terrible road congestion problems in its cities. Infrastructure growth is slow as compared to the growth in number of vehicles, due to space and cost constraints [1]. Also, Indian traffic is non-lane based and chaotic. It needs a traffic control solutions, which are different from the developed Countries. Intelligent management of traffic flows can reduce the negative impact of congestion. In recent years, wireless networks are widely used in the road transport as they provide more cost effective options . Technologies like ZigBee, RFID and GSM can be used in traffic control to provide cost effective solutions. RFID is a wireless technology that uses radio frequency electromagnetic energy to carry information between the RFID tag and RFID reader. Some RFID systems will only work within the range inches or centimeters, while others may work for 100 meters (300 feet) or more. The ZigBee operates at low-power and can be used at all the levels of work configurations to perform predefined tasks. It operates in ISM bands (868 MHz in Europe, 915 MHz in USA and Australia, 2.4 GHz in rest of the world). Data transmission rates vary from 20 Kilobits/second in the 868 MHz frequency band to 250 Kilobits/second in the 2.4 GHz frequency band . The ZigBee uses 11 channels in case of 868/915 MHz radio frequency and 16 channels in case of 2.4 GHz radio frequency. It also uses 2 channel configurations, CSMA/CA and slotted CSMA/CA [5]. The whole paper is grouped into 5 parts. Sections II talks about the literature survey. Section III discusses about the current problems that

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An Android Based Automatic Irrigation System Using Bayesian Network with SMS and Voice Alert

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ABSTRACT

This paper presents an automatic irrigation system to provide water to the farms based on water level conditions using an android application, WSN and GPRS modules. Methods/statistical Analysis: An algorithm is developed such that sensor values are continuously fed to ARDUINO microcontroller. The sensor information is compared with the threshold values and based on that, decision will be taken to water the crops. The system is equipped with the photovoltaic panels and dual communication is established based on cellular-internet interface for continuous inquiry of data by the user. We have also developed an android mobile application for intercepting the data generated and voice alert generated. Findings: Because of system's energy sovereignty, low cost and relatively more amounts of underground water saving, this system is preferable at water scarcity locations like desert areas. Conclusion: This irrigation system has been working with high efficiency and top speed. This system sends message to the user whenever sensors exceed there threshold value, by this system every user can understand the soil conditions and controls the system too manually, if needed.

Keywords: Automatic Irrigation, Arduino UNO, GSM Module, Soil Moisture Sensor, Temperature Sensor, Humidity Sensor

I. INTRODUCTION

Internet of Things (IoT) is the emerging paradigm, which contains huge amount of smart object and smart devices connected to the internet for communicating with each other. IoT devices are used in many fields which make the users' day to day life more comfortable. In recent years, the growth of internet is tremendous and has been further extended to connecting things through internet. All devices are connected to one another with various smart technologies to create worldwide ubiquitous network called IoT. The development of technologies such as IoT generates huge amount of data, leads to new age of information. At the present we are facing many challenges in the real world, which have to deal realistically. By the use of IoT challenges are rehabilitate, which consumes more time, resources and manpower. Efficient water management plays an important role in irrigated agricultural cropping systems. Irrigation is an essential component of crop production in many areas of the world. The measurement of the soil water content (u) through in situdielectric methods are being used more frequently because they are non-destructive, provide almost instantaneous measurements, require little or no maintenance, can remain in the soil during the winter time, can provide continuous readings, they are nonradioactive, accurate measurements may be made near the soil surface, and their cost has decreased substantially in recent years. Self-propelled center pivot and linear-move irrigation systems generally apply water quite uniformly; however, substantial variations in soil properties and water availability exist across most fields.

In these cases, the ability to apply site-specific irrigation management to match spatially and temporally variable conditions can increase application efficiencies, reduce environmental impacts, and even improve yields. The development of a distributed in-field sensor-based site-specific irrigation system offers the potential to increase yield and quality while saving water, but the seamless integration of sensor fusion,

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FPGA Based Real Time Wireless Communication for Tele Health Using Android Phone

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ABSTRACT

In order to enhance the people's health, real time wireless communication system is introduced to monitor the patient's pulse by using an Android OS through FPGA. The end user receive the monitored data by means of GPRS, a wireless communication device. This paper presents the design and implementation of real time monitoring using GPRS between FPGA based embedded system and Android smart phones. This system offers a maximum performance, minimum power and 24 hours real time remote monitoring for tele health.

Keywords : FPGA, GPRS, Android Phone, Sensor, Wireless Communication

I. INTRODUCTION

Due to compatibility and mobility, smart phones have become people's personal assistance. This lead to the revolution of interfacing smart phones with other electronic devices, for example, pulse monitoring equipment. Wireless capability of a smart phone enables the user to control and monitor a wide array of sensors remotely. Android applications are easy to develop, open source and also offers flexibility.

As human health is unpredictable, an alert is required at the time of emergency. Remote medical monitoring allows to collect and view the health related data at the right time. This data is then easily accessed by the health care providers as smart phones are easily synchronized with online database that hosts a Content Management System(CMS).

This paper establishes a wireless communication between the FPGA and Android operating system running on a smart phone via GPRS connection. This design offers a real time monitoring of data such as pulse rate and instantaneously communicating the measured values. For this purpose, sensors are synchronized with FPGA along with a GPRS connector for communicating with the Android application. This system offers long distance connectivity at lower maintenance cost.

II. METHODS AND MATERIAL

1. Architecture

A. Hardware Tools

The FPGA used as the platform for the embedded system is Xilinx Spartan 3E. This extensible processing platform enables the developers to apply a combination of serial and parallel processing to the embedded systems.

The GPRS interface supports the communication between FPGA and Android phone. The board has a SIM connector which is used to connect the SIM with the module and give access to the network.

B. Software Tools

Any Android smart phone with internet access capability can run the application, provided it is compiled for the OS version the phone is running.

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VIDEO CODING BY SCALABLE APPROXIMATE DCT WITH HEVC

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Abstract *- The discrete cosine change (DCT) of length 4 is gotten from the 4 point DCT of estimated part and it's characterized by the High Efficiency Video Coding (HEVC) standard. It is for the most part utilized that for the calculation of DCT and inverse DCT (IDCT) of force of 2 lengths. It permits to ascertain DCTs of length 4, 8, 16 itemized by HEVC. DCTs produced by 4 point DCT include ring down many-sided quality as well as offer better pressure execution. A reconfigurable design is proposed where 8 point DCT utilized for a couple of 4 point DCTs. Utilizing a similar reconfiguration plot 32 point DCT could be designed for parallel calculation of two 16 point DCTs or four 8 point DCTs or eight 4 point DCTs. It offers preferred PSNR over existing. The request of portable associated gadgets has been encountering marvelous development, and by 2019 it is normal that there will be about 1.5 cell phones for every capita Small keen frameworks associated with Internet of Things (IoT) is additionally going to be universal. Coding, deciphering, downloading, and showing of video substance are the most usually utilized functionalities in little versatile associated gadgets. The aggregate power utilization to run these applications has two noteworthy parts: (i) the power utilization in coding (or translating) which is identified with the video codec multifaceted nature, and (ii) the power expended in transmitting or downloading of video which is a component of the bit-rate and relies on upon the pressure productivity of the codec. The proposed concept can perform HEVC video coding with DCT of length 32 point which can be configured by parallel computation of two 16 point DCTs.*

Index Terms—Discrete cosine change (DCT), DCT guess, High Efficiency Video Coding (HEVC)

1.INTRODUCTION

1.1 GENERAL:

The discrete cosine change (DCT) is famously utilized As a part of picture and video pressure. Since the DCT is computationally Intensive, a few calculations have been proposed In the writing to process it proficiently. As of late, huge Work has been done to infer rough of 8-point DCT for decreasing the computational many-sided quality [4]–[7]. The Main target of the guess calculations is to dispose of augmentations which devour the greater part of the power and calculation Time, and to get important estimation of DCT also. Haweel has proposed the marked DCT (SDCT) for 8 Blocks where the premise vector components are supplanted by their Sign, i.e, 1. Bouguezel-Ahmad-Swamy (BAS) have proposed[3] A progression of strategies. They have given a decent estimation of The DCT by supplanting the premise vector components by 0, 1/2, 1. In a similar vein, Bayer and Cintra have proposed Two changes got from 0 and 1 as components of change Kernel[4], and have demonstrated that their strategies perform superior to The strategy in, especially for low-and high-pressure Ratio situations. The need of estimation is more vital for higher-measure DCT since the computational multifaceted nature of the DCT develops Nonlinearly. Then again, present day video coding guidelines Such as high effectiveness video coding (HEVC) [1] utilizes DCT Of bigger square sizes (up to 32) keeping in mind the end goal to accomplish higher Compression proportion. In any case, the augmentation of the outline methodology utilized As a part of H264 AVC for bigger change sizes, for example, 16-point and 32-point is unrealistic. Plus, a few picture handling Applications, for example, following and synchronous pressure And encryption require higher DCT sizes. In this unique circumstance, Cintra has presented another class of

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EXPERIMENTAL INVESTIGATION IN SINGLE CYLINDER VCR MULTIFUEL ENGINE USING DIESEL

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ABSTRACT

VCR Engine is a technology in which the internal combustion engines's compression ratio could be varied. This variation in the compression ratios could bring out a difference in the performance of engine as well as the emission characteristics. This could be done to increase the fuel efficiency. Usually these tests are done with biodiesel which emits very less pollutants based on the raw material used. This study investigates the performance of a Variable compression ratio engine with diesel at 2 compression ratios varying the load from 0kg to 10kgs The results show that the Efficiency obtained with the compression ratio 18:1 gives a better value in terms of its performance when compared to that of 16:1

Key words: VCR Engine, Multi Fuel, Fuel Efficiency.

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1. INTRODUCTION

A VCR engine has been widely tested these days to bring out the best fuel efficiency and also to minimize the pollutants[1-2]. Various tests have been made these days by the researchers using this VCR engines to bring out the comparison results using petrol or diesel. This works investigates on a single cylinder multi fuel VCR Engine at 2 compression ratios 16:1 and 18:1 respectively. Petrol engines have the tendency to limit the max pressure during a compression stroke which would result in detonation rather than burning, and hence to achieve this max

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Location Based Travel Route Recommendation

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Abstract: Trajectory search has long been an attractive and challenging topic which blooms various interesting applications in spatial-temporal databases. In this work, we study a new problem of searching trajectories by locations in which context the query is only a small set of locations with or without an order specified, while the target is to find the k Best-connected Trajectories (k-BCT) from a database such that the k-BCT best connect the designated locations geographically. Different from the conventional trajectory search that looks for similar trajectories w.r.t. shape or other criteria by using a sample query trajectory, we focus on the goodness of connection provided by a trajectory to the specified query locations. This new query can benefit users in many novel applications such as trip planning.

Keywords: Location, Route, Travel, Recommendation, Trajectories

I. INTRODUCTION

In our work, we firstly define a new similarity function for measuring how well a trajectory connects the query locations, with both spatial distance and order constraint being considered. Upon the observation that the number of query locations is normally small (e.g. 10 or less) since it is impractical for a user to input too many locations, we analyze the feasibility of using a general-purpose spatial index to achieve efficient k-BCT search, based on a simple Incremental kNN based Algorithm (IKNN). The IKNN effectively prunes and refines trajectories by using the devised lower bound and upper bound of similarity. Our contributions mainly lie in adapting the best-first and depth-first k-NN algorithms to the basic IKNN properly, and more importantly ensuring the efficiency in both search effort and memory usage. An in-depth study on the adaption and it efficiency is provided. Further optimization is also presented to accelerate the IKNN algorithm. Finally, we verify the efficiency of the algorithm by extensive experiments.

We study a new problem of searching the k Best-Connected Trajectories from a database by using a set of locations with or without an order constraint. Since the number of query locations is typically small, it enables us to adopt a spatial method for answering a similarity search query. We start the study based on a simple IKNN algorithm and then analyze the efficiency of different variants. As a conclusion, we would say that the BF-O achieves the best query performance although involving a risk of high memory usage. The pure DF-C algorithm, although guarantees a low memory consumption, performs poorly in efficiency. Therefore, we further devise the DF-D-M and DF-D-M-O to improve the DF-C for less R-tree node access and shorter query time, and finally their performance are theoretically and experimentally confirmed to be close to that of the BF.

The massive amount of trajectory data collected from GPS has emerged in recent year. Many researchers proposed trajectory queries such as top-k query. They focused to solve them based on distance and text relevance. However, the weight of these queries is unknown. Therefore, we plan to handle the trajectory skyline query based on distance and activity keywords. Furthermore, with the huge amount of keyword semantic trajectories, user may put the wrong activity keyword to search its trajectory. Therefore, it's hard to extract the trajectory based on the exact keyword activity. In this paper, we focused to handle the trajectory fuzzy problem based on edit distance and activity weight. To accelerate the query processing, initially, we used a Distributed Mining Trajectory based on R-tree DMTR-Tree to organize the big trajectory data, then we developed an efficient algorithm to handle the trajectory skyline query. Also, for a rapid computation of the algorithm, we used the cluster computing framework of Apache Spark with Map Reduce as programming model. Theoretical analysis and the experimental results show that query-processing algorithm is efficient and achieve the scalability.

II. DOMAIN OVERVIEW

Researches on Location-Based Service (LBS) have been emerging in recent years due to a wide range of potential applications. One of the active topics is the mining and prediction of mobile movements and associated transactions. Most of existing studies focus on discovering mobile patterns from the whole logs. However, this kind of patterns may not be precise enough for predictions since the differentiated mobile behaviors among users and temporal periods are not considered. In this paper, we propose a novel algorithm, namely, Cluster-based Temporal Mobile Sequential Pattern Mine (CTMSP-Mine), to discover the Cluster-based Temporal Mobile Sequential Patterns (CTMSPs). Moreover, a prediction strategy is proposed to predict the subsequent mobile behaviors. In CTMSP-Mine, user clusters are

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Secure Logging as a Service In Cloud

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ABSTRACT

Data and authorization security are needed everywhere. In case dealing with huge number of data in a cloud server, secured logging is must. This is because cloud servers are easily accessible and any one can access anywhere at any time. This is because intruders may have knowledge about the network where they are going to intrude. So data should be preserved well for intruders, hackers and unauthorised user. The main objective of this paper is to develop a secured logging as a service in cloud architecture. So in the proposed method, privacy and preservation methods are implemented. The secured logging contains six major functionalities to ensure more securities: Correctness, Confidentiality, data logs, Privacy, Preservation and VPS (Virtual proxy server). Confidentiality deals with sensitive information not displaying during search. Data logs deals with the data history for identifying appropriate users. Privacy scheme deals with file linking and data access history. So that secured logging as a service is much important for all kind of cloud server environment in order to provide proper login for authorized user and triggers out the unauthorized users.Preservation deals with enhanced colour code. Hackers can be avoided and intruders are can't be avoided.

Keywords : Secure Logging, Cloud Server, Virtual Proxy Serve, Network Security, Cloud Computing, SLAS, IaaS, PaaS, NAT

I. INTRODUCTION

Cloud Computing is a type of Internet-based computing that provides shared computer processing resources and data to computers and other devices on demand. It is a model for enabling ubiquitous, on-demand access to a shared pool of configurable computing resources (e.g., computer networks, servers, storage, applications and services),which can be rapidly provisioned and released with minimal management effort.

Network Security consists of the policies and practices adopted to prevent and monitor unauthorized access, misuse, modification, or denial of a computer network and network-accessible resources. Network security involves the authorization of access to data in a network, which is controlled by the network administrator. Users choose or are assigned an ID and password or other authenticating information that allows them access to information and programs within their authority.

II. METHODS AND MATERIAL

OBJECTIVE

Primary Objective

- The primary objective of this project is creating a secured data access with Secured Logging as a Service.
- The Secured Logging as a service will be enabled for both admin and user.
- The motivation is to find out the difference between User, Intruder, and Hackers. From the way of logging in to their networks

Secondary Objective

- Even thou admin login is more secured user should mention the security level of the uploading file.
- Improved Gaussian Mixture and Keystroke password enabled.
- Even keystroke value got leaked, the another security level of colour code was enabled.
- Log will records each activities of the user logging in
  - Last Accessed date
  - Last Accessed file

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Incremental Query Processing by Relevance Feedback Using Big-Data Streams

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ABSTRACT

This paper presents deals social network in large scale distributed server data storing and retrival process is more complex.There has been an explosive increase in media data,such as images,videos and social media in the internet,mobile devices, and desktops.Engineers and researches are dealing with data sets of petabyte scale in the cloud computing paradigm.Thus, the demand for building a service stack to distribute,manage and process massive data sets has risen drastically.Data collection has become easy due to the rapid development of both mobile devices and wireless networks.During the processing of image queries. Many factor are affecting quality of the retrievel system. Image searching and ranking , indexing are the insufficient factors to affect the quality of image search results. There are many factors which affect the quality of image search results.The learning of the model is from the image output extracts the designed with the evolutionary feedback system to perform the image retrievel by processing the image search query.

Keywords : Query Optimiztion using Feedback Processing, Backtracking Process.

I. INTRODUCTION

Data mining is a developing science and it can be defined and categorized in a number of ways depending on the specific knowledge domain. For example, this has manifest in the domain of biological science where the technology of data mining has been applied successfully and categorized as bioinformatics. Various techniques have been employed within bioinformatics to filter out the useful data to gain valuable information. High dimensional big Media data like audios, images and videos are growing rapidly nowadays. Emerging with this increasingly growing volume of data is the need to retrieve relevant contents from such large databases. The fundamental scientific problem behind this need is the nearest neighbor search problem. Typical graph applications include predicting biological activity of molecules, identifying errors in computer programs, and categorizing scientific publications. Unlike traditional vector data, graphs are only characterized by node-edge representation and no features are readily available for training prediction models. Taxonomies are the key to developing successful applications in a domain, such as information retrieval, knowledge searching and classification. In particular, considering the ever-growing amount of text digital data per year, taxonomy learning from text is a primary research area for developing such applications nowadays. Kernel methods have emerged as a versatile mechanism to handle generic data. The growing interest in kernels is mainly motivated by the positive impact they have in important applications such as data clustering and classification.

II. METHODS AND MATERIAL

A. Proposed System

The idea of the project is to implement the query optimization using the Feedback collection such as positive & negative Feedback.The Learning process is made by Supervised Learning in this we know the result which is going to produce.For this Ranking and Learning Process is used.

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Analysing the Social Data Opinion through Public User Raw Information

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ABSTRACT

The social network perspective provides a set of methods for revealing the structure of social networks as well as a variety of hypothesis explaining the patterns discovered in these structures. The study of these structures uses social network discovering to recognizing local and global patterns; locate influential entities, and proficiency network dynamics. Millions of users share their opinions on Social Networks, making it a valuable platform for tracing and analyzing public sentiment. Such tracking and analysis can provide critical information for decision making in various domains. Therefore it has captivated attention in both academia and industry. This approach needs Sentimental data analysis model using Neural Networks. Both positive and negative also comments will be calculated here. To further enhance the readability of the mined reasons, we select the most representative tweets for foreground topics and develop another generative model called Reason Candidate and Background LDA (RCB-LDA) to rank them with respect to their popularity within the variation period. Experimental results show that our methods can effectively find foreground topics and rank reason candidates.

Keywords : LDA, RCB-LDA, KDD, CVS, SVN, ANY, ANN

I. INTRODUCTION

Data mining for software engineering techniques consists of gathering software engineering data, extracting some knowledge from it and, if possible, use this knowledge to improve the software engineering process, in other words "operationalize" the mined knowledge. For instance, researchers have extracted usage patterns from millions of lines of code of the Linux kernel in order to find bug. In essence, data mining for software engineering can be decomposed along three axes: the goal, the input data used, and the mining technique used.

Data engineering at large consists of many tasks from specification, design, development, monitoring at runtime, etc. Each task is itself decomposed in many smaller scale tasks. For example, a programmer constantly switches between tasks, such as navigating code, reading documentation, writing code, debugging, etc. During the last decade, it has been shown that most software engineering tasks can benefit from data mining approaches, the tasks being whether technical or more people oriented. Data mining is to discover structure inside unstructured data, extract meaning from noisy data, discover patterns in apparently random data, and use all this information to better understand trends, patterns, correlations, and ultimately predict customer behavior, market and competition trends, so that the company uses its own data more meaningfully to better position itself on the new waves. The term Knowledge Discovery in Databases (KDD) is generally used to refer to the overall process of

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A Shoulder Surfing Resistant Graphical Authentication System

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ABSTRACT

People enjoy the convenience of on-line services, but online environments may bring many risks. We propose a virtual password and QR code concept involving a small amount of human computing to secure users' passwords in on-line environments. We adopted user-determined randomized linear generation functions to secure users' passwords based on the fact that a server has more information than any adversary does. We propose differentiated QR code mechanisms in which a user has the freedom to choose a virtual password scheme ranging from weak security to strong security, where a virtual password requires a small amount of human computing to secure users' passwords. A functionis used to implement the virtual password concept with security for complexity requiring a small amount of human computing. For user-specified functions, we adopt secretlittle functions in which security is enhanced by to generate QR CODE.

Keywords : Graphical Passwords, Authentication, Shoulder Surfing Attack.

I. INTRODUCTION

Today, the Internet has entered into our daily lives as more and more services have been moved online. Besides reading the news, searching for information, and other risk-free activities online, we have also become accustomed to other risk-related work, such as paying using credit cards, checking / composing emails, online banking and soon. While we enjoy its convenience, we are putting ourselves at risk. Most current commercial websites will ask their users to input their user identifications (IDs) and corresponding passwords for authentication. Once a user's ID and the corresponding password are stolen by an adversary, the adversary can do anything with the victim's account, which can lead to a disaster for the victim. As a consequence of increasing concerns over such risks, protecting users' passwords on the web has become increasingly critical. In this paper, we present a password protection scheme that involves a small amount of human computing in an Internet-based environment or an ATM machine, which will be resistant to phishing scams, Trojan horses, and shoulder surfing attacks. We propose a virtual password concept involving small amount of human computing to secure users 'passwords in online environments. The trade-off is that stronger schemes are more complex. Among the schemes, we have a default method (i.e., traditional password scheme), a system recommended function, a user-specified function, a user-specified program and so on. A function/program is used to implement the virtual password concept by trading security for complexity by requiring small amount of human computing. We analyse how the proposed schemes defend against phishing, key logger, shoulder surfing and multiple attacks. In user-specified functions, we adopt secret little functions in which security is enhanced by hiding secret functions/algorithms.

II. METHODS AND MATERIAL

1. Existence Approaches

In the Existing system, the access code will be sent to the mobile using that user login to the website. Access code security is not there. We present a password protection scheme that involves a small amount of human computing in an Internet-based environment or an ATM machine, which will be resistant to phishing frauds, Trojan horses, and shoulder surfing attacks.

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DIRECT GROWTH OF VERTICALLY ALIGNED CARBON NANOTUBES ON SILICON SUBSTRATE BY SPRAY PYROLYSIS OF *GLYCINE MAX* OIL

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ABSTRACT. Vertically aligned carbon nanotubes have been synthesized by spray pyrolysis from *Glycine max* oil on silicon substrate using ferrocene as catalyst at 650 °C. *Glycine max* oil, a plant-based hydrocarbon precursor was used as a source of carbon and argon as a carrier gas. The as-grown vertically aligned carbon nanotubes were characterized by scanning electron microscopy, high-resolution transmission electron microscopy, X-ray diffraction, thermogravimetric analysis, and Raman spectroscopy. Scanning electron microscopic images reveal that the dense bundles of aligned carbon nanotubes. High resolution transmission electron microscopy and Raman spectroscopy observations indicate that as-grown aligned carbon nanotubes are well graphitized.

KEY WORDS: Spray pyrolysis, Vertically aligned CNT, Ferrocene, Silicon substrate

INTRODUCTION

Vertically aligned carbon nanotubes are quasi-dimensional carbon cylinders that align perpendicular to a substrate [1]. Aligned carbon nanotubes represent an important architecture of CNTs because they can be used directly as field emitters in flat panel displays as reinforcing agents in composite materials [2, 3]. Furthermore, vertically aligned carbon nanotubes also exhibit a high capability to produce high current densities under low operating voltages [4]. Aligned carbon nanotubes possessing larger surface area and higher electrical conductivity over entangled CNTs, are ideal electrode material for DNA biosensor [5], energy storage device [6], sensors for glucose [7], pH [8] as well as NO_2 [9]. Jung *et al.* demonstrated laser transmission welding of vertically aligned carbon nanotube arrays for joining polymer sheets [10]. Aligned carbon nanotubes reported by Thess *et al.* were able to bundle 70% of the volume of nanotubes into crystalline ropes in 1996 [11]. Fan *et al.* introduced position controlled growth of vertically aligned CNT on porous and plain silicon substrate [12]. CNT arrays have successfully grown on different substrates such as quartz substrate [13], planar silicon substrate [14]. Ferrocene and its derivatives are significant as regards biological applications [15]. Ferrocene has been shown to be a good precursor of iron nanoparticles suitable to catalyze CNT growth [16-17]. Conventionally hydrocarbons such as methane, ethane, ethylene, acetylene, xylene and ethanol were used as a carbon source for the synthesis of CNTs [18-23]. The number of studies utilizing low-cost carbon sources for the synthesis of CNTs such as botanical hydrocarbon is very limited [24-28]. Afre *et al.* have used spray pyrolysis method and prepared aligned carbon nanotubes from ferrocene and turpentine oil mixture on quartz and silicon substrates [29]. Instead of using conventional petro chemicals, we rather use a natural precursor – *Glycine max* oil. From our previous study it is proved that *Glycine max* oil have been found to be an efficient precursor of

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Hybrid compression scheme using precoding block and fast stationary wavelet transformation

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Abstract: In this paper a hybrid compression using precoding block and Fast Stationary Wavelet Transformation have been proposed for standard and compound images. The proposed method is the extension of transformation based compression process. It has two operations 1. precoding, 2. transformation. The first process is precoding in which the original image is divided into (n×n) non overlapping blocks then each block is combined with the precoding block, which have different level of gray values. When the original pixel value is nearer to the precoding block element, then the original pixel value is rounded near the precoding element data. Secondly the precoded image data has been transformed by FSWT (Fast Stationary Wavelet Transformation) and got the energy compaction.The proposed technique is dually reduce the size of the information by precoding block and transformation. So it is very much suitable for compressing all types of images.

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Efficient FPGA Implementation of AES 128 Bit for IEEE 802.16e Mobile WiMax Standards

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Abstract

In the present era of high speed communication, wireless technology plays a predominant role in data transmission. In the timeline of wireless domain, Wi-Fi, Bluetooth, ZigBee are some of the standards used in today's wireless medium. In addition, WiMax is introduced by IEEE as IEEE 802.16 standard for long distance communication, and mobile WiMax as 802.16e. WiMax is an acronym of worldwide interoperability for microwave access. It helps to provide wireless transmission with high quality of service in a secured environment. Privacy across the network and access control is the predominant goal in the wireless protocol. In the wireless environment one of the most widely used security algorithms in MAC layer is Advanced Encryption Standard (AES). Especially Medium Access Control (MAC) sub layer should be evaluated in the security architecture. AES is used in the MAC layer that consumes more power and involves high cost. So, in this paper an optimized architecture of AES 128 bit counter mode security algorithm for MAC layer of 802.16e standard is proposed. The SBOX and MixColumn transformation are modified in the architecture of AES to achieve optimized power and delay. The design has been implemented in Xilinx virtex5 device and power has been analyzed using XPower analyzer. It is compared with two standard existing architectures. The simulation results revealed a power reduction of 41% compared to existing one.

Keywords

AES Encryption/Decryption, Galois Field, Low Power Architecture, Electronic Code Book Mode, FPGA Implementation

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Autonomous Control of Interlinking Converter with Energy Storage in Hybrid AC-DC Microgrid

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Abstract— Due to the decade of fossil fuels, renewable energy plays an important role to supply the power to meet our load requirements. The main drawback of renewable energy system is its installation cost is very high and renewable energy sources are mainly unpredictable. To eliminate the drawbacks in renewable energy, hybrid system plays a major role. Hybrid system is an interconnection of two or more sources. In this project solar energy and battery are used as a two different sources. Power from the solar energy is boosted by boost converter and boost converter act as a impedance matching network. When internal impedance of solar is matched with the boost converter impedance power will be transfer from source to load. Battery power is boosted by boost converter and output of solar and battery added together and given as a input to the inverter. To connect the 3 phase line to the microgrid it is necessary to find 3 phase network. Hence BLDC motor is used as load because it is used to verify the 3 phase network. The proposed design has an advantage i.e., battery bank and solar panel acts as a source, hence the uninterrupted power obtained to run the system

Key words: component; formatting; style; styling; insert (key words)

I. INTRODUCTION

The Smart residential units are often connected to a non-conventional energy sources to provide smart energy. Due to the complexity of the space allocation, these dedicated energy sources are highly localized and have low terminal power and voltage ratings. The power ranges typically, on the order of a hundred watts. Conventional designs involve two separate converters, a DC–DC converter such as boost converter (e.g., boost) and a voltage source inverter (VSI), connected either in cascade or in parallel manner, supplying DC and AC outputs at VdcOut and VacOut, respectively. Depending upon the requirements, topologies providing higher gains may be required to achieve step-up operation .This project investigates the use of single boost-stage architecture to supply hybrid loads.

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The Need for Renewable Energy

Renewable energy is one of the resources it comes from the natural resources such as wind energy, solar energy, water and geothermal heat energy. These resources are renewable and it maybe recycles and uses it for further use. Therefore it is used for all practical purposes, these resources can be considered to be inexhaustible, because the other important resources like conventional fossil fuels leads to damage or highly risky state composition. The global energy crunch has provided a renewed impetus to the growth and development of Clean and Renewable Energy sources. Apart from the rapidly decreasing reserves of fossil fuels in the world, another major factor working against fossil fuels is the pollution associated with their combustion.

II. DIFFERENT SOURCES OF RENEWABLE ENERGY

A. *Wind Power:*

Wind turbines can be used to harness the energy available in airflows. Current day turbines range from around 600 kW to 5 MW of rated power. Since the power output is a function of the cube of the wind speed, it increases rapidly with an increase in available wind velocity. Recent advancements have led to aero foil wind turbines, which are more efficient due to a better aerodynamic structure.

B. *Solar Power:*

The tapping of solar energy owes its origins to the British astronomer John Herschel who famously used a solar thermal collector box to cook food during an expedition to Africa. Solar energy can be utilized in two major ways. Firstly, the captured heat can be used as solar thermal energy, with applications in space heating. Another alternative is the conversion of incident solar radiation to electrical energy, which is the most usable form of energy. This can be achieved with the help of solar photovoltaic cells or with concentrating solar power plants.

C. *Small Hydropower:*

Hydropower installations up to 10MW are considered as small hydropower and counted as renewable energy sources These involve converting the potential energy of water stored in dams into usable electrical energy through the use of water turbines. Run-of-the-river hydroelectricity aims to utilize the kinetic energy of water without the need of building reservoirs or dams.

D. *Biomass:*

Plants capture the energy of the sun through the process of photosynthesis. On combustion, these Plants release the trapped energy. This way, biomass works as a natural battery to store the suns Energy and yield it on requirement.

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Structural and thermo-optic studies on linear double hydrogen bonded ferroelectric liquid crystal homologous series

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ABSTRACT

A novel series of supramolecular hydrogen bonded ferroelectric liquid crystal (HBFLC) is formed through hydrogen bonding interaction between nonmesogenic dextro-levo tartaric acid (DLTA) and mesogenic p-n-alkyloxy benzoic acids (nBAO, where n = 7 to 12). The formation of hydrogen bond in the complex is confirmed through Fourier transform infrared spectroscopy (FTIR) studies. Optical and thermal behaviors for mesomorphic phases of individual complex in the series are meticulously studied by means of differential scanning calorimetry (DSC) and polarizing optical microscopy (POM). Computation of the enthalpy values in the homologous series of complex during both heating and cooling cycles is proved that thermal equilibrium exhibited by the complex system. Extended thermal span width and rich liquid crystallinity is observed in the present complex due to the presence of aromatic ring with chiral center. Thermal stability factor and thermal equilibrium are also discussed. Presence of alkyloxy chain on either side of chiral molecules hinder the abundant reduction in phase transition temperature and lowered melting point compared to the individual mesogens. Optical tilt angle for smectic C* phase is determined and the same is fitted to a power law.

KEYWORDS

Smectic; POM; DSC; thermal stability factor

1. Introduction

Liquid crystals (LCs) exhibiting the intermediate phases between isotropic liquid and solid crystal during their phase transitions which have both liquid and crystal properties [1]. Molecular orientation and self-assembly systems are the basic requirements for exhibiting these interesting properties. A single LC may not satisfy all the requirements of our day-to-day life applications. Usually, supplement/compliment properties of multicomponent LC mixture is more useful for industrial applications. In particular more than two LCs are mixed with each other in definite molar ratio, it gives major effect on intermolecular hydrogen bonding and results in diversity of thermodynamic and optical properties [2–4]. In the recent decade, various research groups all around the world interesting to work on the synthesis of liquid crystal complexes through intermolecular hydrogen bonding [5–7]. The variety

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