Number of research papers per teachers in the Journals notified on UGC website in A.Y. 2020-21									
S.No.	**Title of paper**	**Name of the author/s**	**Department of the teacher**	**Name of the journal**	**ISSN number**	**Link to website of the Journal**	**Link to article/paper/abstract of the article**	**Is it listed in UGC Care list/Scopus/Web of Science/other, mention**	**Page No.**
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2	Severe plastic deformation of AA 5083 and copper bimetallic metal	**Ananda Babu Varadala**, Swami Naidu Gurugubelli, et al.	Mechanical Engineering	SN Applied Sciences	2523-3971	https://www.springer.com/journal/42452	https://link.springer.com/article/10.1007/s42452-020-03384-9	Scopus	7
3	Kinetics of dissociation of bis(2,4,6-tripyridyl-s-triazine)iron(ii) and tris(2,2â€²-bipyridyl)iron(ii) in the presence of triton x-100/tween 80 mixed micellar medium	**Srikanth Vemuri R.S.S**., Shyamala P., Ameer Khan Sk.	Basic Sciences and Humanities	Asian Journal of Chemistry	0975-427X	https://asianjournalofchemistry.co.in/Home.aspx	https://www.asianpubs.org/index.php/ajchem/article/view/2061	Scopus	8
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DESIGN AND SIMULATION OF HETEROGENEOUS ADDER USING XILINX VIVADO

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Abstract –Adders are the logic circuits designed to perform high speed Arithmetic operations in the Arithmetic Logic Unit used in the processors. The basic Adders are Half Adder and Full adder. Different types of adders are Ripple Carry Adder(RCA), Carry Look ahead Adder(CLA), Carry Skip Adder(CSKA), Carry Select Adder(CSLA). In this paper, Heterogeneous adder architecture is designed with the help of different Homogeneous adders and Heterogeneous adders are compared with the Homogeneous adders in terms of Area, Delay and Power. This architecture is based on a VHDL and compares their performance with Xilinx VIVADO software tool.

Keywords- Adders, Ripple Carry Adder, Carry Look ahead Adder, Simulation, VHDL, etc.

I. INTRODUCTION

Arithmetic operations play an important role in various digital systems. Adders are the key components in general purpose Microprocessors and Digital signal Processors. Adders are used to perform the Addition of numbers, Multiplication ,Subtraction and Division operations. They require low efficient power and area designed technique to increase the performance of the circuit. Therefore, the area efficient design makes the chip size smaller ,reduces the cost. The different adders are Ripple Carry Adder, Carry Look ahead Adder, Carry Select Adder, Carry Skip Adder.

Here Heterogeneous adder means concatenation of different homogeneous adders and Homogeneous adder is the combination of the same type of adders. The designed adder is compared with each other in terms of area and power along with the simulation result and implementation using Xilinx VIVADO.

II. RELATED WORK

A. Ripple Carry Adder:

Ripple carry adder can be designed by cascading full adder in series i.e., carry from previous full adder is connected as input carry for the next stage. Full adder is a basic building block of Ripple carry adder. Therefore, to design a n-bit parallel adder, it requires n full adders. The block diagram of Ripple carry adder is as shown below

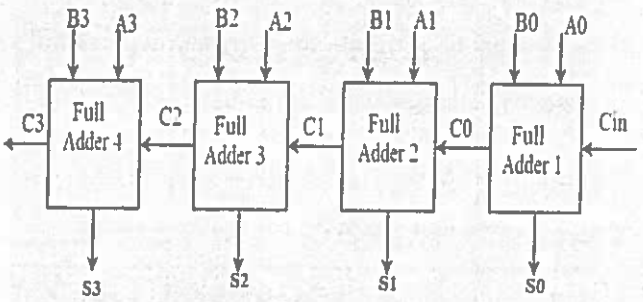


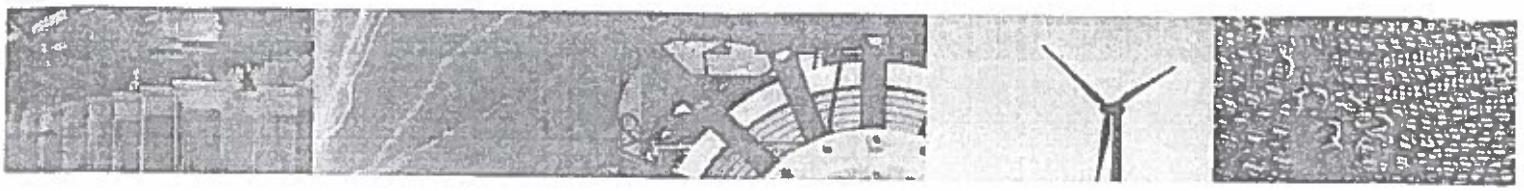
Fig.1: 4-Bit Ripple Carry Adder

Example: A=1010 ; B=0101 ;Cin =0 are the inputs of the adder than the output is S=1111 with a carry '0'.

The major limitation of ripple carry adder is that as the bit length goes on increase, delay also increases.Since each full adder must wait for the carry bit from the previous full adder. So Ripple carry adder is relatively slow.

B. Carry Look Ahead Adder:

Carry Look ahead adder is also known as the Fastest Adder. It improves the speed by reducing the amount of time required to determine the carry bits. The block diagram of the Carry Look aheadAdder is as shown below



Research Article

Severe plastic deformation of AA 5083 and copper bimetallic metal

Ananda Babu Varadala[1] · Swami Naidu Gurugubelli[2] · Sateesh Bandaru[3]

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Abstract
The purpose of the present study is to investigate the effect of Cu casing and wall thickness of the drilled copper bars on uniform distribution of imposed stain in terms of structural homogeneity and distribution of micro-hardness in the severely deformed AA 5083 after equal channel angular extrusion (ECAE). In this study, AA 5083 cylindrical inserts of 6 mm, 8 mm and 10 mm diameter with 100 mm length are tightly inserted in the 16 mm square copper bars having the respective diameter holes. The square cross sectioned AA 5083 billets of 16 mm × 16 mm and 100 mm length are also considered as feedstock. The longitudinal surfaces of the bimetallic metals are polished and annealed at 530 °C for 1 h and then processed by ECAE up to four passes in route A (same sense after every pass without any rotation) at room temperature using a die with square cross-sectioned channels having channel intersection angle (ϕ) 105° and outer corner angle (Ψ) 30°. The initial grain size of 60 µm has been greatly refined and the ultrafine grains of the sizes in the range of 400–700 nm are formed in the extruded AA 5083 inserts after the four passes. The microhardness of extruded AA 5083 significantly increased from 69 to 134 VHN, 132, 176 and 157 respectively for the square billets without Cu casing and cylindrical inserts with the diameters of 6, 8 and 10 mm covered with Cu casing after the four passes. The variations in the microhardness measurements at different regions on the sectioned surfaces are also investigated in this study. The requirement of pressing force is very significantly reduced by using copper casing which is having more ductile nature and the frictional forces between the copper and steel die are very less as compared to the Aluminium and steel. The chances of formation of dead metal zone are avoided by filling the corner gap by cooper metal during the ECAE process. The uniform distribution of strain imposed on the severely deformed billets develops the homogeneous ultrafine grain structure and significantly improves the micro-hardness of the processed material.

Keywords ECAE · Al–Mg alloy · Grain refinement · Copper casing · Microhardness

1 Introduction

Equal channel angular extrusion is a most significant process among various Severe Plastic Deformation (SPD) processes for improving mechanical properties of materials by producing ultrafine grains [1]–[3].The process of ECAE uses a die having two channels of similar cross-section connected at a specified channel angle (ϕ) and outer angle (Ψ) [4]. When the material passes through the plastic deformation portion of the die high shear strain is induced in the materials [5, 6]. The processing route can be altered between the successive passes by using different orientations of the billets in 0° (route-A), 90° in an alternate orientation (route-B_A), 90° in same orientation (route-B_C) and 180° (route-C) [7]. Selection of appropriate die angles, pressing route (A, B_A, B_C, C), pressing speed, pressing temperature and number of passes control the strain developed and the microstructural changes [8, 9]. ECAE with casing is a novel technique in which the billet is inserted in the metallic or non-metallic casing or capsule

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Kinetics of Dissociation of *bis*(2,4,6-Tripyridyl-*s*-triazine)iron(II) and *tris*(2,2′-Bipyridyl)iron(II) in the presence of Triton X-100/Tween 80 Mixed Micellar Medium

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Surface tension studies were carried on the binary surfactant mixtures over a wide range of Triton X-100 mole fractions and total surfactant concentrations to obtain critical micellar concentration values. These values were used to determine the composition of the mixed micelles and the average interaction parameter (β) which contains all the interactions of the mixed surfactants. The method is based on Rubingh's theory using a Gauss-Newton iteration technique written in FORTRAN. The value of β was found to be -0.69 indicating synergistic behaviour *i.e.*, combined positive catalytic effect of both the surfactants on rates of reactions. Hence, the kinetics of dissociation of *bis*(2,4,6-tripyridyl-*s*-triazine)iron(II) ($[Fe(tptz)_2]^{2+}$) and *tris*(2,2′-bipyridyl)iron(II) ($[Fe(bipy)_3]^{2+}$) were studied in the presence of Triton X-100/Tween 80 mixed micellar medium. The reactions have been carried out in the presence of mixed micelles of Triton X-100/Tween 80 at various mole fractions of Triton X-100 ($\alpha_{TX\text{-}100}$ = [Triton X-100]/([Triton X-100] + [Tween 80])) and at different total surfactant concentrations of Triton X-100 and Tween 80 (C_t = [Triton X-100] + [Tween 80]). The results show that as $\alpha_{TX\text{-}100}$ increases the rate increases for all values of C_t. Kinetic analysis has been carried out by using a simple pseudo phase model and binding constants were determined. These binding constants were found to be in agreement with the binding constants obtained spectrophotometrically.

Keywords: *s*-Triazine, Iron(II), 2,2′-Bipyridyl, Mixed surfactants, Triton X-100, Tween 80.

INTRODUCTION

Mixed normal micelles are defined as normal micelles formed from monomers of two different surfactants in aqueous solutions. These systems are used in all commercial applications because they can be produced at relatively lower cost compared to single pure surfactants and their performance can be improved compared to single surfactants. Since various types of combinations of surfactants are possible the composition and concentration of mixed surfactants can be optimized to produce different properties for various practical applications [1]. Physical properties of mixed micelles solutions are reported by different theoretical models such as Clint [2], Nagarajan [3], Attwood *et al.* [4], Puwada & Blankschtein [5], Munoz *et al.* [6] and Motomura *et al.* [7]. Up to now, various physicochemical aspects such as CMC measurements [4,8], micelle composition and aggregation numbers [8,9] micelle demixing and modeling [4,9] were studied in the presence of mixed micelles but very few studies on kinetics of unimole-cular reactions in the presence of mixed micelles are reported in literature [6,10,11].

The study of dissociation of *tris*(2,2-bipyridyl)iron(II) $[Fe(bipy)_3]^{2+}$ and *tris*(1,10-phenanthroline)iron(II) $[Fe(phen)_3]^{2+}$ and related complexes has been studied by several workers. Basolo *et al.* [12] reported a kinetic study of dissociation of $[Fe(bipy)_3]^{2+}$in aqueous medium in the presence of acid. They found that the dissociation of the complex is accelerated by H^+ ion, the rate reaching a limiting value at $[H^+] = 1.0$ mol dm^{-3}. Sriramam *et al.* [13] also investigated the reaction in the aqueous acetic acid media including mineral acids and found a linear variation of rate with H^+ ion concentration reaching a limiting value. The reaction also has an acid-independent path. The solvent effect on the dissociation of $[Fe(phen)_3]^{2+}$ and related complexes has been investigated in detail by [illegible] *et al.*

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Applied Physics A
Materials Science & Processing

Enhanced dielectric and magnetic properties in Mn-doped bismuth ferrite multiferroic nanoceramics

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Abstract
Multiferroic nanoparticles of manganese doped bismuth ferrite with the chemical formula, $Bi_{1-x}Mn_xFeO_3$, with x values of 0, 0.025, 0.05, 0.075 and 0.1, were synthesized by sol–gel autocombustion method. X-ray diffraction measurements and Rietveld structural refinements were performed on the samples to ensure the formation of rhombohedrally distorted perovskite phase for all the samples. Dielectric measurements of the samples have been carried out in a wide range of frequencies from 1 to 40 MHz and at different temperatures in the range from 30° to 450 °C. Temperature-dependent dielectric anomalies were observed and the same were attributed to structural inhomogeneities at around 150°–270 °C, and to typical free charge carrier hopping mechanisms and anomalies at around 270°–420 °C. Impedance analysis of the samples provides indirect support for the reasons discussed in the dielectric properties and the corresponding electrical conductivity behaviour in these samples. Magnetic measurements were carried out to understand the influence of Mn ions on the magnetic behaviour of the studied multiferroics. The results of all these measurements are well discussed, and they indicate a considerable enhancement in the magnetic order with Mn doping and also a decrease in the dielectric loss with an evidence magnetoelectric coupling and thus making them useful for device applications.

Keywords Multiferroic nanomaterials · Sol–gel auto combustion method · X-ray diffraction · Impedance spectroscopy · Magnetic measurements · Dielectric measurements

1 Introduction

Multiferroics are an important class of materials to explore as they simultaneously control ferroelectric and ferromagnetic orders leading to novel magnetoelectric properties, and they have vast potential for applications in spintronic devices, sensors and memories [1, 2]. In fact, the magnetoelectric (M-E) coupling between magnetic and electric orders in these multiferroics helps to induce magnetic polarization by making use of electrical field or vice versa. It has been explored previously to understand the fundamental physics behind the emergence of multiferroic materials [3, 4]. From the theoretical background, ferroelectricity and magnetism are two reverse phenomena. It is well known that ferroelectricity requires empty "*d*" shell while magnetism needs partially filled "*d*" shell [5]. Interestingly, it is noticed that the "*d*" electrons in transition metals cause reduction in the tendency for off-centred ferroelectric distortion in many systems [6]. Hence, an extra electric or structural driving force should exist in any multiferroic system in order to achieve ferromagnetism and ferroelectricity simultaneously. Multiferroics, in general, depending on the constituent phases involved in their fabrication, are broadly categorized into two groups. One group is single-phase multiferroics, like $BiFeO_3$, $YMnO_3$, $HoMnO_3$, $TbMnO_3$, $TbMn_2O_5$, and $Ni_3V_2O_8$. In this class of materials, the coupling strength between the ferroic orders is weak because

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Optimized utilization of interline power flow controller in an integrated power system

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Abstract

Purpose – There is a worldwide need to amplify the usage of renewable energy in the manufacture of electrical energy. Thus, the integrated energy systems (IESs) have become a major part of today's power systems. Wind and solar energies are intermittent power sources and may lead to voltage and power flow instabilities. The purpose of this paper is to use the interline power flow controller (IPFC) for limiting the overloading of the transmission lines and improving the voltage stability of the IES.

Design/methodology/approach – This paper deals with an integrated system consisting of wind and solar energies and conventional systems. An appropriate position for the IPFC in the IES is proposed based on the disparity line utilization factor. The IPFC is then tuned for decreasing the loss of power and lessening the voltage deviation using the grey wolf algorithm.

Findings – The method is implemented on a modified IEEE 30-bus system. Results from the study show that the mega volt ampere (MVA) loading of the overloaded lines is reduced for the IES. Also, the voltage stability and the voltage profile of the system are improved to a major extent. The real and reactive power loss of the system is also brought down.

Originality/value – The use of renewable energy sources is a need of the present world to overcome environmental problems. This research focuses on the use of flexible AC transmission system (FACTS) devices with renewable sources incorporated in the power system. Very limited research has been done in this field. The IPFC, which is one of the most advanced FACTS device, is used for the study.

Keywords Integrated power system, Interline power flow controller, Optimization, Grey wolf algorithm, Integrated energy sources

Paper type Research paper

1. Introduction

Although there is a worldwide concern about atmospheric pollution, there is still an increased consumption of electricity across the globe. This has led to installation of renewable energy power plants globally. The usage of renewable energy in the power production is likely to rise by 40 per cent in the next two decades. This has brought up a new scenario for the integrated energy system (IES), which is an integration of renewable sources and conventional power plants. Because the renewable systems are intermittent in nature, the IES power systems tend to suffer from stability issues.

Any disturbances at any end of the network affect the complete system connected to it. Hence, system modeling is the most important stage of power system study and analysis. Many academicians and research scholars have analyzed and modeled the IES. The IES has been modeled effectively by various methods (Hu *et al.*, 2017; Sirvent *et al.*, 2017; Correa-Posada *et al.*, 2017). Research has been done in further improving the utility of the energy source (Clegg and Mancarella, 2015; Shao *et al.*, 2017). Some researchers have studied the operation of the IES in contingency cases (Bai *et al.*, 2017). To reduce the cost of power systems, optimal scheduling of the individual energy source has been proposed in the study by Quelhas *et al.* (2006). An optimal power flow (OPF) approach for reducing the overloading and operating cost of transmission lines has been proposed (Sun *et al.*, 2017). Researchers have proposed optimization models for optimal usage of the energy (Ha *et al.*, 2017; Kou *et al.*, 2017).

Flexible AC transmission systems (FACTSs) are preferred to find solutions to several problems related to power systems. The interline power flow controller (IPFC) is one of the most advanced FACTS devices (Hingorani and Gyugyi, 2000). It has been used for resolving various power system optimization problems. It has been used for the OPF (Yang, 2006) to overcome congestion in transmission lines and to solve contingency problems (Mishra and Nagesh Kumar, 2016a, 2016b).

In this paper, an IPFC is optimally placed and tuned in an IES scenario for an IEEE system with 30 buses. The value of the voltage stability index (VSI) helps in defining the location

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ADAPTIVE WINDOW- BASED FRACTAL DIMENSION ESTIMATION FOR WEIGHT MAPS IN CONTRAST IMPROVED MULTI- SENSOR FUSION

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Abstract

In this paper, as a primary processing step, visible images acquired at low illumination conditions are processed. Lower and large parameter based Stochastic Resonance models in Discrete Wavelet Transform domain is considered for primary processing. The pre-processing approach prior to fusion provides better scene interpretation and improves the performance of visible sensor sensitivity to night or low dynamic conditions. The contrast-enhanced visible image and infrared image fusion are then performed using a weighted average scheme. In the proposed algorithm, the weights considered for fusion are calculated using an adaptive window-based Fractal Dimension computation. Adaptive window-based Fractal Dimension weight maps computed in this approach has a significant effect on improving the sharpness and edge information of the final fused image. The quantitative features of the fused image in terms of its contrast, sharpness, symmetry and visual information are evaluated. Simulation results on various test images prove that the proposed approach for fusion is simple and has enhanced quality and quantitative outcome compared to recent techniques.

Keywords: Adaptive window, Contrast enhancement, Fractal dimension, Multi-Sensor fusion.

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Research articles

Magneto-optical fiber sensor based on Fabry-Perot interferometer with perovskite magnetic material

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ABSTRACT

Perovskite mixed valence magnetic ($La_{0.7}Ba_{0.3}MnO_3$) material is explored as a magneto-optical sensor by integrating onto the surface of an optical fiber. The guiding properties of core modes excited by the material cavity are modulated by the external magnetic field. The experimental results concluded that the device exhibits linear response to applied magnetic field strength in the range of 0–20 mT with the sensitivity of 228 pm/mT and resolution of 0.87 Oe. Blue-shift phenomenon has been observed in the interference pattern, when a magnetic field is applied. Such wavelength shift is attributed to the influences of magneto-optical properties on optical-wave propagation. The results reveal the feasibility of developing an index-tuneable magneto-optical sensor using perovskite magnetic material.

1. Introduction

With the vast advancement in opto-electronics and magneto-optics, research on novel devices, has become important because of the tuneable refractive index and flexibility of these devices. Magnetic fluid (MF) exhibits strong optical birefringence under external magnetic field which attracts a great deal of consideration due to their amazing magneto-optic properties [1–4]. A rigorous research has been carried out on MFs and thin films [5,6].The magneto-optical devices have been demonstrated with tapered or etched fibers by integration of MFs [7–9]. Dilute and defective semiconducting materials were also utilized for magneto-optical performance based on dopant and defect induced magneto-optical effects [10–12]. The polymer (poly ethylene-co-vinyl acetate) and magnetic material (Nd-Fe-B) as a composite material was used for optical fiber magnetic field measurements [13]. Generally, MF was utilised in magneto-optical devices in the form of thin films or reflective interfaces due to their large birefringence properties [3,14–16]. The MFs exhibit unusual optical properties when an external magnetic field is applied such as tuneable refractive index, change in birefringence, magneto-strictive and Faraday rotation. The main characteristic of these devices is to change the state of polarization under the influence of applied magnetic field. The various optical fiber models have been reported using MFs such as Fabry–Perot devices [17], single mode-multi-mode-single-mode (SMS) structures [18], multimode-single-mode-multi-mode (MSM) structures [19], Fiber Bragg Grating (FBG) [20], and Long Period Fiber Bragg Grating (LPFG) [21]. Peng Zu et al. reported on the effect of bandgap tunability by MF filled PCF with the sensitivity of 1.56 nm/Oe and resolution of 0.0064 Oe [22].

From recent studies in spintronic showed that the perovskite magnetic materials possess very less coercive field values. The perovskite magnetic materials are of great attention for magneto-resistance (MR) and spintronic applications. Like ferrite materials, perovskite manganese oxides such as La_{1-x} (Ba, Sr, Ca)$_x$ MnO are well known ferromagnetic materials. These perovskite materials exhibit magneto-optical effects such as Magneto optic Kerr effect (MOKE) and Surface magneto optic effect (SMOKE) [23–25]. In this prospective, if one could explore them by intense core mode field, it can yield extremely good out comes in the optical domain. This report mainly focusses on demonstrating a method of investigating the structural, magnetic measurement and magneto-optical effect of $La_{0.7}Ba_{0.3}MnO_3$. The proposed $La_{0.7}Ba_{0.3}MnO_3$-optical fiber configurations could open the path as photonic platform for magneto-optic modulator, magnetic field sensors, mining detection and MRI applications.

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A two-stage processing approach for contrast intensified image fusion

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Abstract

Purpose – Integrating complementary information with high-quality visual perception is essential in infrared and visible image fusion. Contrast-enhanced fusion required for target detection in military, navigation and surveillance applications, where visible images are captured at low-light conditions, is a challenging task. This paper aims to focus on the enhancement of poorly illuminated low-light images through decomposition prior to fusion, to provide high visual quality.

Design/methodology/approach – In this paper, a two-step process is implemented to improve the visual quality. First, the low-light visible image is decomposed to dark and bright image components. The decomposition is accomplished based on the selection of a threshold using Renyi's entropy maximization. The decomposed dark and bright images are intensified with the stochastic resonance (SR) model. Second, texture information-based weighted average scheme for low-frequency coefficients and select maximum precept for high-frequency coefficients are used in the discrete wavelet transform (DWT) domain.

Findings – Simulations in MATLAB were carried out on various test images. The qualitative and quantitative evaluations of the proposed method show improvement in edge-based and information-based metrics compared to several existing fusion techniques.

Originality/value – In this work, a high-contrast, edge-preserved and brightness-improved image is obtained by the processing steps considered in this work to get good visual quality.

Keywords Image decomposition, Renyi entropy, Stochastic resonance, Statistical measures

Paper type Research paper

1. Introduction

Analysis of a scene captured from multiple modalities is achieved easily from the integrated or fused representation. An infrared sensor senses the thermal radiations from the object and captures the image with good target information. These sensors are generally not affected by climatic changes and work well at all day/night conditions. However, the infrared image has poor resolution and suffers from providing the texture details of the scene because of low thermal contrast (Toet *et al.*, 1997). On the contrary, a visible sensor captures the reflected light and provides texture details that include background information of the same scene suitable for human perception with high spatial resolution. The target information provided by the visible sensor is poor because of sensor sensitivity to weather and lighting conditions (Paramanandham and Rajendiran, 2018). The complementary information acquired by the infrared and visible sensors needs to be combined to provide both target and detailed information in a single image suitable for target detection and identification, and improve situational awareness in military, navigation, night vision and surveillance applications. Several infrared and visible sensor fusion techniques in various transform domains for different applications are available in the literature. State-of-the-art methods (Ma *et al.*, 2019) proposed earlier focus on producing an amassed image with high human visual quality. But the texture details in the visible image are indistinguishable, have poor contrast and low gray levels when captured under poor lighting conditions (Bhatnagar *et al.*, 2015). Fusion of such visible image information with an infrared image may not provide high contrast and brightness in the output image. The visible sensor sensitivity to illumination changes may affect the fused image quality. To make the details clear and to refine the fused image quality, the primary focus of this paper is to increase the contrast of the poor illuminated visible image through enhancement by decomposition prior to fusion which is an extension to our previous work (Teku *et al.*, 2016).

Image enhancement is a primary step in most of the image processing applications. The traditional histogram equalization approach enhances the quality of the image but results in

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Structural and electrical properties of Nd^{3+} doped ferroelectric barium sodium niobate ceramics

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ABSTRACT

Ferroelectric polycrystalline samples of $Ba_4Na_2Nb_{10}O_{30}$ with rare earth neodymium ion, member of the family of TB, were prepared using a high temperature solid state reaction technique and studied their electrical properties in a range of temperature (RT to 300 °C) at 1 KHz. X-ray diffraction analysis of these compounds shows the formation of single phase tetragonal structure at room temperature. Detailed studies of the dielectric properties suggest that they have undergone diffuse ferroelectric–paraelectric phase transition well above the room temperature. It has also been found that as the concentration of the neodymium increases, Curie temperature observed to be decreased. Measurements of electrical DC Conductivity as a function of temperature suggest that the compounds have semi conductivity properties the temperature, with positive temperature coefficient of resistance (PTCR) behavior.

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KEYWORDS
Barium sodium niobate; TB structure; dielectric constant; resistivity

1. Introduction

Compounds with a tetragonal tungsten bronze structure are very interesting with regard to their piezoelectric, pyroelectric, ferroelectric and ferroelastic properties which can be modulated by suitable ionic substitutions. A considerable number of researchers have been carried out by insertion in the 12 and 15 coordination sites of monovalent, divalent, trivalent or tetravalent cations [1, 2]. Among the TB type materials BNN has been found to be the one of the most versatile ferroelectric because of their many useful nonlinear, electro-optic, elasto-optic and piezoelectric properties [3, 4]. Further it is a common practice now a days that additives are used for the aid of densification or control of grain growth so as to improve the useful properties of the ceramics. In view of this we have studied the effect of trivalent Nd^{3+} on the dielectric, resistivity and crystallographic behavior of BNN and the results are reported in this paper.

2. Experimental details

The required samples were prepared by conventional high temperature solid state technique using reagent grade sodium, barium carbonates and oxides of neodymium and

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Inverse kinematic analysis of 5-axis hybrid parallel kinematic machine using CAD and regression analysis approach

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Abstract: Since three decades for their potentially desirable fast dynamic performance, rigidity, and acceptable accuracy parallel kinematic machines (PKM) attracted interest from industry and academia in the machine tool/robot sectors. PKMs are highly used for their higher accuracy as it relies on system stiffness and rigidity. In PKM, the inverse kinematic analysis for finding the velocity and acceleration of a limb having more than two degree of freedom (DOF) manually is tedious. Also, generation of transformation matrix is too complex. In present work, six degrees of freedom 5-axis hybrid parallel kinematic machine (HPKM) with hemisphere workspace has been modelled and assembled in CATIA. Secondly, inverse kinematic analysis of PKM was carried out in digital mockup unit (DMU), CATIA. The velocities and accelerations of all the three limbs at three different feed rates and variations in joint angles were found. On the other hand, the regression equations were generated for velocity and acceleration of three limbs, joint angles with respect to position and time, while the tool travels along the semi circular contour trajectory.

Keywords: 5-axis HPKM; inverse kinematics; digital mockup unit; DMU; contour trajectory; regression analysis.

Reference to this paper should be made as follows: Suryam, L.V. and Balakrishna, B. (2020) 'Inverse kinematic analysis of 5-axis hybrid parallel kinematic machine using CAD and regression analysis approach', *Int. J. Computer Aided Engineering and Technology*, Vol. 13, No. 4, pp.475–507.

Biographical notes: L.V. Suryam has nine years of teaching experience in the field of Mechanical Engineering. Currently, he is working as an Assistant Professor in Vignan's Institute of Engineering for Women, Visakhapatnam, Andhra Pradesh. He is also a Research Scholar in the Department of Mechanical Engineering, JNTUK, Kakinada. His area of research interest includes parallel kinematic machines, robotics, CAD/CAM and machining and manufacturing technology.

V BAND FREQUENCY RECONFIGURABLE ANTENNA FOR MILLIMETER WAVE APPLICATIONS

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A compact V band frequency reconfigurable microstrip patch antenna is introduced in this paper. The introduced antenna is a Psi shaped patch designed to operate at 48GHz. This basic structure is modified by introducing PIN diodes, radiating slots, and resistors on the surface of the patch which exhibits multi-band operation at 63Ghz, 65GHz, 69GHz, and 70GHz and is well suitable for 5G applications. The compactness of the introduced antenna is 8mmX8mmX0.254mm and operates at the Millimeter-wave range i.e (30GHz-300GHz). the two PIN diodes are arranged on either side of the feeder and asymmetric slots with resistors are placed on the substrate which controls the feed line. this structure achieves the frequency reconfigurability. The patch is made of copper material and the antenna is designed on a material known as ROGERS R03003 substrate with properties of ε=3 and δ=0.0013and due to the dielectric loss for high-frequency performance used an EM simulator which is HFSSv16. The simulated results show optimum gain and wide bandwidth at the operating frequency.

KEY WORDS: *Millimeter-wave, V band, 5G, PIN diodes, Resistors*

1. INTRODUCTION

With the rapid development of science and technology, Reconfigurable antenna plays a major role in smart and adaptive systems. The Reconfigurable antenna has become one of the subjects for many research studies, there is a [illegible] requirement for the integrating of various wireless standards into a single [illegible] it is most demand the antenna reconfigurability. On performing a literature survey, the Reconfigurable antenna which is used for 5G application is a millimeter-wave that occupies the frequency spectrum from 30GHz -300GHz.A single antenna cannot operate at multiple frequencies to achieve multi-band operation used a Reconfigurable antenna and the reconfigurability may be due to a change of Polarization, Radiation pattern, Gain, or Frequency. The easiest method to reconfigure an antenna is frequency reconfiguration due to its wide range of applications. The Frequency Reconfigurability can be obtained by using PIN Diodes, Resistors, MEMS, and Varactor diodes. PIN Diodes are one of

Proficient SAR Analog to Digital Converter Using CCAS

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Abstract: VLSI is a field of electronics engineering which aims to reduce the size of the device by putting millions and billions of transistors logically together on to a single chip. VLSI opens a way to create power efficient, portable, low cost and environment friendly circuits. Modern electronic world is completely digitalized and there is a necessity to convert all the analog signals to digital for further processing. Sample and hold circuit plays a vital role in analog to digital conversion. Current conveyor analog Switch (CCAS) is a better solution for the digital world as it offers high speed and less power dissipation when comparing with existing sample and hold circuits. The paper presents the design of Successive Approximation Register (SAR) analog to digital conveter with the help of CCAS. The functional verification is done with the help of Mentor Graphics Tool. The obtained results matching with the expected ones show that this will be an efficient solution for analog to digital convertor design.

Keywords: CCAS, SAR, ADC

Introduction

Digital revolution or Third Industrial Revolution is the continuous change and evolution from the existing models of analog, mechanical and electronic technologies to digital technology. VLSI plays a major role in digital revolution. Even though almost every system makes use of digital technology after the digital revolution, some signals on which these systems are to be operated are still analog like output from sensors, speech signal, light entering into the digital camera...etc. In order to manipulate these signals using digital system there is a necessity to convert these analog signals into digital signal. Here comes the role of analog to digital converter in the digitalized world. The sample and hold circuit plays a major role in deciding the efficiency of the widely used Successive Approximation Register ADC. The power dissipation is a major challenge faced by the modern VLSI technology as well as the digital technology. This paper presents an efficient successive approximation ADC design with the help of current conveyor analog switch. The performance analysis is done with the help of Mentor Graphics tool. The rest of this paper is organized as follows. Section II presents OPAMP based sample and hold circuit. Section III describes current conveyor analog switch. The proposed SAR ADC using CCAS presents in section IV. Section V includes results and discussions and finally concluded in Section VI.

Sample And Hold Based On Opamp

The OPAMP based on the sample and hold circuit is shown in figure1. The idea here is to turn off the transistors in its saturation region of operation. Here the MOS transistors are included at the output node. The transistors are in off condition so that there will be no channel charge. The terminology makes use of differential topology and it can cancel out the error due to the parasitic capacitance. The circuit behaves in its ideal state during sampling mode. The output node is at high impedance state when it is at hold state. Thus this mode can store the charge. The buffer which is placed at the output is always in on state. Operational amplifier when designing as sample and hold circuit faces some limitation like gain band width product and high slew rate. To overcome these draw backs, current mode devices can be used in sample and hold designs. Current mode circuits provide attractive alternatives to their voltage mode counter parts by providing extra features. This includes realization of functions, accuracy, frequency range and linearity.

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Cost and revenue analysis of an impatient customer queue with second optional service and working vacations

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ABSTRACT

In this article, we propose a finite buffer impatient customer queue with second optional service (SOS) and working vacations. When the server is busy, an arriving customer either joins the queue or balks on the basis of state-dependent joining/balking probabilities. For each customer, the server provides two phases of service, namely, first essential service (FES) and SOS. All the customers demand FES, whereas only few customers opt for SOS after the completion of FES. At a service completion instant, if the system is empty, the server leaves for working vacation. During working vacations, the waiting customers activate an impatient timer which is exponentially distributed. It is assumed that the interarrival times, vacation times, service times during FES, SOS and during working vacations follow exponential distribution. The steady-state probabilities of the model and various performance measures are derived. In order to optimize the total expected cost of the system, particle swarm optimization technique has been adopted for finding the optimum service rates of the server. Numerical results are sketched out to demonstrate the impact of the system and cost parameters.

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Balking; Cost–revenue; Particle swarm optimization; Reneging; Second optional service; Working vacations

MATHEMATICS SUBJECT CLASSIFICATION
60K25; 90B22

1. Introduction

Queueing systems are being used in a wide variety of congestion problems encountered in day to day as well as industrial scenario including computer systems, call centers, web services and communication networks, waiting lines at airports, banks, public offices, etc. Numerous queueing models have been developed for nearly a century to study the performance of many systems. In many queueing scenarios, the server may leave for a vacation when there are no customers present in the system. On the other hand, working vacations (WV) is one kind of vacation policy under which the server can serve the customers at a lower speed during the vacation period rather than stopping service completely. This kind of vacation policy was introduced by Servi and Finn (2002) in an $M/M/1$ queue wherein the server leaves for working vacations whenever the system empty. Such type of vacation policy is known as multiple working vacations (MWV). Servi and Finn (2002) studied an $M/M/1$ queue with working vacations and analyzed a WDM optical access network. Subsequently, Wu and Takagi (2006) generalized

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INDERSCIENCE Online

Indexing documents with reliable indexing techniques using Apache Lucene in Hadoop

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Abstract

Mostly 85% of the data is presented in the form of text, which is the human-readable format. Present educational, business, medical organisations, etc. making use of big data analytics for storage of data and processing that stored data by using information retrieval. Often time's text documents have been transferred from one system to another system without any restrictions like, structured, unstructured and semi-structured data. Systems are well performed with high speed and less complexity only when it has all the data arranged in an orderly way. This paper describes how documents of text data are being Indexed using Apache Lucene with approaches in Hadoop. Most of the applications that deal with huge data over the internet are completely lacking. Use of effective analysis and techniques allow users in resulting high-performance and a challenging option in leading big data analytics.

Keywords

Apache Lucene, indexing, big data, indexing techniques

Hydrogen Storage Capacity in Ni/Pd@f-MWCNTS Decorated Graphene Oxide/Cu-BTC Composites at Room Temperatures: A Sustainable Cleaner Energy Production

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Abstract

Hydrogen is considered to be one of the renewable and cleanest energy source and most probable successor of conventional petroleum fuels. Hydrogen storage in nanoporous materials has been attracting a great deal of attention in recent years. The addition of carbon materials such as graphene oxides (GOs) and carbon nanotubes (CNTs) into MOFs can improve the physicochemical properties of parent MOFs with excellent chemical, mechanical and distinguished electronic thermal robustness. The decoration of the surface of graphene by metal could greatly facilitate the hydrogen storage. In the current study, the parent materials and their composites synthesized have been characterized by powder x-ray diffraction (XRD), scanning electron microscopy (SEM), transmission electron microscopy (TEM), and gas adsorption isotherms. The composite systems, GO/Cu-BTC/Ni@f-MWCNTs and GO/Cu-BTC/Pd@f-MWCNTs reached a hydrogen storage capacity of 3.91 and 4.21 wt. % at 77 K and 1.23 and 1.71% at 298 K.

Article Preview

Top

1. Introduction

Due to the on-going urbanization and growth of the world's population, there will be about 2.5 billion more people added to the urban population by 2050, mainly in Asia. These results increase stress on the natural resources which are available today (Sachs, 2008). Transport infrastructure is one of the most important factors for a country's progress. Although India has a large and diverse transport sector with its own share of challenges, like air pollution, depletion of relic fuels, etc. these can be overcome by energy-efficient technologies (Cigu et al., 2019). Sustainable transport systems are one amongst them which are majorly required for our country to progress and to compete with other countries. The sustainable transport system will decrease the stress on natural resources, pollution and help in reducing global temperatures (Aldakhil et al., 2019). As we also know that energy shortage is globally rampant due to fossil fuel level depletion which has prompted researchers to quest for alternative energy sources (Ansari & Holz, 2019). So, there is a need for other energy sources which replenish the gasoline products and at the same time remove problems corresponding to enormous emissions of greenhouse gases which are leading to climate change. In order to mitigate these greenhouse gases and to produce clean energy sources such as hydrogen came into light due to their efficacy towards substitution of relic fuels (Attari et al., 2019). Hydrogen is considered to be one of the renewable and cleanest energy sources and most probable successor for the conventional petroleum fuels. The most challenging aspect is the storage of hydrogen for hydrogen-powered vehicles (Zarbo et al., 2019). Until now, full implementation of a hydrogen-based energy system has been hindered in part by the challenge of storing hydrogen gas (Zoolfakar et al., 2014). The goal of a new hydrogen economy is to develop a suitable hydrogen storage medium to meet the U.S. Department of Energy (DOE) target of 1.5 kWh/kg system (5.5 wt % hydrogen) by 2020 for onboard light-duty vehicles, material-handling equipment, and portable power applications (USDOE). Metal-Organic frameworks (MOFs) are rapidly emerging as a promising material for gas storage applications (Panella et al., 2004, Thomas, 2009, Züttel et al., 2004, Langmi et al., 2003). Their exceptionally large surface area with tunable pore size and volume make them a good storage medium for clean energy applications especially for hydrogen (Hirscher et al., 2010). Among various MOFs, Cu-BTC [Cu_3(benzene-1,3,5-tricarboxylate)$_2$(H_2O)$_3$], is one of the most studied open framework materials for gas adsorption and storage applications (Chui et al., 1999). A

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Implementation of Activity Based Costing & a Study of its Trends in Banking Industry

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Abstract

The competitive environment in the banking industry *has made it very difficult to increase revenues and market share that is sufficient in growth and maximizing shareholder's wealth. The minimal growth in the area plus the over-saturation of banks, financial institutions and other sectors competing for the traditional* banking *products has forced banks to look at ways to control their costs to reach the profitability levels that are necessary to appease their stakeholders. Banks are seeking ABC platforms that can meet a wide variety of needs - concurrently and over time. No one ABC approach or model design will fit all parts of an organization. The organization must find tools flexible enough to meet a variety of needs and evolve as those needs change. ABC means Activity based costing is a method used in manufacturing units to define the stock maintenance based on the requirement to avoid cash blocked in form of stock or raw material. In banking sector cash is the core element. And maintenance of cash in liquid form is a must. To maintain this liquid cash is done by ABC model is a n attempt by the authors.*

Keywords Banking industry, ABP, Performance Management scorecards, customer profitability

Introduction:

Indian financial system is divided basically into two major parts as primary market and secondary market. But if we check in detail they can be broken down into 4 categories each interlinked and depending on each other.

Dr. GVPK

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A Critical Analysis of Business Environment Prevailing in Covid-19 India

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Abstract

India has proved to be a star in the global economies in recent years, evidently growing at 9.2 percent in 2017 and 9.6 percent in 2016. This remarkable enhancement in the growth in comparison to the previous years has been supported by several major infrastructure improvements, market reforms, consequently leading to high inflows of FDI, rising foreign exchange reserves both an IT and real estate boom, and a flourishing capital market. Thus we can say that India possesses several remarkable and worth mentioning features which make it an attractive destination for business investors. While several barriers and obstacles have been removed by the government of India, there still remain formidable and appalling challenges for the foreign investors doing business in India.

The key to success is to understand and prepare for these challenges.

The proposed article is an effort to understand and critically analyze the business environment in India in the present scenario and the opportunities and challenges it provides for the activity and growth of business. *Foreign investors are visualizing India as an* ***attractive investment destination*** *owing to the prospects of high returns. Enormous Corporate and Multinational Companies from the world over have established and expanded themselves in*

Distributed Metadata Management for Large Storage Systems using Hierarchical Bloom Filter Arrays

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Abstract - An efficient and distributed scheme for file mapping or file search is critical in decentralized metadata management that is cluster-based. In this paper, the Hierarchical Bloom Filter Arrays (HBA) technique is used to map filenames to the metadata servers holding their metadata. On each metadata server, Bloom filter arrays with different levels of accuracies are used, one array is with low accuracy and it represents the distribution of entire metadata, whereas the other array with high accuracy that stores partial distribution information. This information utilizes the temporal locality of file access patterns. And these two are replicated to all metadata servers to support fast local lookup.

Keywords – ***Distributed file system, Bloom filter, File system management, Metadata management.***

I. INTRODUCTION

Rapid advances in general-purpose communication networks have motivated the deployment of inexpensive components to build competitive cluster-based storage solutions to meet the increasing demand for scalable computing. Since all I/O requests can be classified into two categories, that is, user data requests and metadata requests, the scalability of accessing both data and metadata has to be carefully maintained. A straightforward extension of the BF approach to decentralizing metadata management onto multiple Metadata Servers (MS) is to use an array of BFs on each MS. The metadata of each file is stored on any of the metadata servers which is called a home server.

II. LITERATURE SURVEY

Decentralizing metadata management and comparing them with the HBA scheme, it summarizes the existing state of the approaches. Both advantages and disadvantages will be there for each existing system. Metadata workloads balanced by hashing based mapping approach inherently have fast metadata lookup operations, but it has slow directory operations such as listing the directory contents and renaming directories. In addition, when the total number of MS changes, rehashing all existing files generates a prohibitive migration overhead. Few hashing techniques available are:

2.1 Table-Based Mapping: Globally replicating mapping tables is one of the approaches to decentralizing metadata management. There is a salient trade-off between the space requirement and the granularity and flexibility of

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Offline Handwritten Character Recognition using Neural Network

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ABSTRACT

An Ultimate objective of handwritten character recognition is to simulate the human reading capabilities so that the computer can read, understand, edit and work as human do with text using neural networks. Handwriting Character recognition 'has been one of the most challenging research areas in field of image processing. Even though a lots of research work have been done in the field of HCR, there is a problem we are facing in getting the best accuracy. This paper describes the techniques for converting textual content from a paper document into machine readable format. The purpose is to develop the software with a very high accuracy rate and to complete in a minimum amount of time and space complexity and also optimal.

Key Words:

Neural Networks, Geometric Feature Extraction, Segmentation, Handwriting Character Recognition, Textual Content.

1. INTRODUCTION

It is very simple to the human beings to understand the handwritten characters or typed documents as we have ability to learn. This ability can also be induced to the machines by using machine learning and artificial intelligence.The field which deals with this problem

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A NOVEL STEGANOGRAPHIC TECHNIQUE TO EMBED SST ENCRYPTED MESSAGE USING PGLM

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ABSTRACT:

Security plays an essential role in data transfer. Steganography is a traditional technique for providing security to the data which is to be transferred over a network. An approach of image steganography using PGLM (Pairwise Grey Level Modification) is presented. In this project SST (Shifting Swapping Transpose) is used to encrypt the secret message. First, the given secret message is converted into an encrypted form using SST. Then, the modified text is embedded into a greyscale image using the PGLM technique. By using cryptography along with steganography provides a two-level security for the secret message. After embedding, the altered or stego image is very similar to the original image, so it is hard and difficult for the hacker to detect the existence of the message in an image.

KEYWORDS:

Greyscale Image, Stego Image, Encryption, Steganography, Cryptography.

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Hiding of CAPTCHA in a colour image using FNP Algorithm

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ABSTRACT- Steganography is data hiding technique in internet. Now a days, website became the identity for many businesses. Many companies offer a lot of free services to the users. Every user wants to register on the site. So, for avoiding spam registrations on the site the CAPTCHA is developed. The word CAPTCHA is actually acronym for "Completely Automated Public Turing Test to tell Computers and Human Apart". Generally, computers are not capable of solving captcha. But hackers are looking for ways to bypass this security measure using sophisticated bots. To foolproof websites many CAPTCHA techniques are introduced. But these can be time consuming and frustrate the users. So users may switch to websites without CAPTCHAs. One solution to solve this problem is to display the CAPTCHA only when required to block the bots. We propose a steganography technique in which we send CAPTCHA codes within a cover image. Actually, CAPTCHA codes are embedded into cover image in an encrypted form resulting stego image and thus attackers also cannot fetch the actual CAPTCHA resulting in a secured transmission of confidential data via internet using image steganography.

Keywords: ASCII, CAPTCHA, Cover image, Stego image.

1. INTRODUCTION

1.1 Background

The CAPTCHA is a type of challenge test used in computing to identify whether the user is human or not. CAPTCHA comes in several sizes and of different types. These all works quit well against spam. Some are harder to solve, some are fun and some will benefit you monetarily on your website. There are many types of CAPTCHAs but the most widely used are word solving, Audio, 3D, Math solution, Drang and Drop, Jquery Slider, Tic Tac Toe etc. Online businesses use forms for registration and signups to provide services to their users. Bots usually target such forms and fill them with junk information which bias the acquisition flow metrics for the business. CAPTCHA is usually implemented to stop such spam registrations from bots. but there are certain sophisticated bots that do bypass CAPTCHA and end up spamming forms. Eventhough CAPTCHA do block simple bots from spamming website, there are certain sophisticated bots which started bypassing them by using outsourced teams that can even solve in real time.

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RETRIEVAL OF FEATURED IMAGES USING FACE DETECTION

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ABSTRACT

Content based Image Retrieval (CBIR) is additionally a bunch of techniques for retrieving semantically-relevant pictures from an image database supported automatically-derived image options. Generally, in CBIR systems, the visual features are described at low-level. They're simply rigid mathematical measures that can't influence the inherent subjectivity and fogginess of individual's understandings and perceptions. As a result, there is a distinct segment between low-level features and high- level semantics. We have an inclination to are witnessing the time of massive information computing where computing the resources is popping into the foremost bottleneck to handle those massive datasets. With within the case of high dimensional data where every view of information is of high spatially, feature selection is important for extra raising the clustering and classification results.

In this paper, as there is a tremendous growth in image collection in our digital devices. This results in lot of difficulty in identifying any particular person's images from the gallery. Face identification, though very intuitive to humans is a tremendously challenging task in computer's vision. In this we are, presenting a technique that first deals with extracting the images from the data set. The dataset may have the images in different ages and next, will extract features from the extracted images. Every unique feature is considered as one unique individual. And then, cluster the images of every unique individual based on the similarity of features in every image. Now, a sample image of the particular person whose images are needed to be retrieved is provided so that the cluster related to that sample image will be obtained. Old images will also be retrieved without considering the pixel clarity and image resolution as we are identifying the similarity of features.

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A Secure Approach for Communication in Mobile Adhoc Networks

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Abstract— **A Wireless Mobile unintended network could be a distributed type of wireless network. The network is unintended because it doesn't depend on a previously existing network data system, like routers in wired networks. Each device in a MANET is liberal to move independently in any direction. But there are more challenges for secure communication during this own created network. The major goal of this project is to supply a framework to shield secure routing and communication together within the mobile unintended network. This framework is meant to permit existing network and routing protocols to perform their functions, detecting the shortest path generated between the networks and to send the packets through the path in a secure way.**

Keywords—Mobile unintended networks, communication system security

I. INTRODUCTION

MANET is a network less data system, dynamic, and robust network consisting of a set of wireless mobile nodes that usually communicate with one another without the utilization of any centralized authority. It's a continuously self-configuring, network less data system of mobile devices connected without wires [1]. These nodes are liberated to move about arbitrarily. Now, security has become a primary concern to produce secure, protected communication between nodes in an exceedingly potentially hostile environment. Moreover, the unique features of MANETs presents a brand new set of security challenges. Several researchers aim at securing the routing messages of existing routing protocols like AODV and DSR etc, and that the proposed solutions supported cryptographic mechanisms to form routing protocol secure, however, this mechanism requires a key management service to stay track of key and node binding. Also, it needs a trusted entity called the certificate authority (CA) to issue a public key certificate for each node within the network.This can be "hard security" mechanisms and too expensive for MANETs. As a result, we were motivated to develop a trust-based secure routing protocol for MANETs [4]. Some MH's are highly mobile, while others are primarily stationary. It's difficult to predict an MH's movement and pattern of movement. Due to this sort of nature, a protocol should be considered for detecting the shortest path to be generated between the network and to send the packets through the path in an exceedingly secure way.

II.LITERATURE SURVEY

Wireless communication and also the lack of centralized administration pose numerous challenges in mobile wireless ad-hoc networks (MANETs) [2]. MANETs depend on intermediate nodes to route messages between distant nodes. Lacking infrastructure to administrate the style during which packets are routed to their destinations, MANET routing protocols instead make use of routing tables on every node within the network, containing either full or partial topology information. Reactive protocols, like Adhoc On-demand Distance Vector (AODV) [3], plan routes when messages must be sent, polling nearby nodes in an endeavor to seek out the shortest route to the destination node. Optimised Link State Routing (OLSR) [6] takes a proactive approach, periodically flooding the network to get routing table entries that persist until the following update. Both approaches are motion-tolerant and are implemented in UAV MANETs [7], [8]. The fundamental versions of AODV and OLSR lack security mechanisms[8],[7]. Many MANET routing protocols assume trust between nodes, which may be a critical weakness in terms of security, essentially an assumption may allow malicious nodes to interfere with routing mechanisms. Routing attacks can misuse the route discovery and topology generation process of routing protocols [3]. Access control has been identified as a security dimension that may address the difficulty of implicit trust within a MANET.

III. EXISTING METHOD

In MOBILE topology AD-HOC NETWORKS they do not protect the route, leaving the network vulnerable to attacks on them. It either provides the security for routing or security for communication but it does not provide security for both. The protection that these protocols offer is aimed at the protection of network routing services. These protocols do not protect data sent over the secured routes. It does not protect both network and application. Closing the network requires a way of allowing nodes to affix and leave the closed network. Authentication provides the means by which a node may be identified as trustworthy. When the node is attacked while transmission of data then the data will be passed to the destination node in the max route path in the existing system.

PROFICIENT PHONOCARDIOGRAM USING BLUETOOTH MODULE

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Abstract: A phonocardiogram (or PCG) may be a plot of high-fidelity recording of the sounds and murmurs made by the guts with the assistance of the machine called the phonocardiography. This technique of testing follows various design styles in the modern world in order to improve efficiency. Researchers are keeping an eye on its cost, accuracy, delay and complexity as the test is conducted by physicians to assess the condition of the heart. This project is intended to design an efficient phonocardiogram system with high accuracy rate, low cost, less time delay, noise immunity and wireless structure. The system is implemented in such a way that it will sense the heart signal pulses and display the output in an embedded device using Bluetooth. The overall system is controlled by Arduino Uno, which is an open-source microcontroller board supported the Microchip ATmega328P microcontroller.

Keywords: AD8232 sensors, Arduino, ESP8232s wifi and Bluetooth module

1. INTRODUCTION

PCG signals or heart sounds have been studied for the past many years. Phonocardiography plays an important role in cardiac care as they're non-invasive, inexpensive but accurate monitoring methods for valves functioning and easily repeatable with no risk to the patient. However, heart diagnosis by auscultation requires high skills and knowledge of the listener. Heart failure and stroke cause a big burden on society due to their high costs of care, lower quality of life and premature death. Technological advances have been facilitating the research into both the creation of new ideas and the development of existing methods for monitoring physiological signals. The application of engineering to this biomedical problem is appropriate, as scientific measurement theory is well in advance of technology used in clinical situations. The specific area which this thesis addresses is the sound or acoustic signals produced by the heart, their retrieval from the PCG audio data base and classification of cardiovascular diseases. In particular, pathological conditions of the heart produce sounds which are different from those of the "normal" heart. As such, the transduction of these sound vibrations may be used for the detection and classification of heart pathologies.

2. EXISTING TECHNIQUE

Digital stethoscopes can be used as a phonocardiography to record heart sounds. However, procuring a costly digital stethoscope might not be possible under resource-limited conditions. A low-cost, wire connected, and mobile phone-assisted phonocardiography has been reported previously. The aim of this study was to develop a low-cost and wireless

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Analog Pulse Compression Technique with Improved SNR and Reduced Sidelobes

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Abstract: **Pulse Compression is a signal processing technique used in radars to increase Signal to noise ratio and range resolution. In this paper we discuss about Linear frequency modulation (LFM) and Non-linear frequency modulation (NLFM). In this pulse compression can be done by using Matched Filter. In this paper we calculated the peak side lobe ratio. By using matched filter and transversal filter, order N like Hamming window, Hanning window, Kaiser window, Blackman window we increase the signal to noise ratio (SNR) and reduces the side lobe level. The Non-linear frequency modulation (NLFM) provides high signal to noise ratio compared to Linear frequency modulation (LFM).**

***Keywords*: Pulse compression, Linear frequency modulation (LFM), Nonlinear frequency modulation (NLFM), Matched Filter, Window techniques.**

1. INTRODUCTION

Radar is a system that uses electromagnetic waves to detect, locate and measure the speed of reflecting objects such as aircraft, ships, spacecraft, vehicles and terrain. Radar transmits that electromagnetic signals into free space and receives that echo signal reflected from the objects. Pulse compression is a technique used to convert long pulse into a short pulse. Because the energy content of long pulse with low peak power is same as the short pulse with high peak power. Linear frequency modulation or phase modulation increases the bandwidth of the transmitted signal. The long duration pulse strike with different number of targets and the echo is returned to the receiving antenna. Pulse compression techniques are used to

increase the range resolution and signal to noise ratio.

Range resolution is defined as the ability of the radar to distinguish between two or more targets which are placed close to each other with different ranges. In range resolution pulse width is the primary factor based on width of the transmitted pulse the degree of range resolution is defined. The amount of energy in the pulse is increased by decreasing the width of the pulse depends on the width of the transmitted pulse. hence get maximum range detection, depends on the strength of the received echo. For long distance transmission the transmitted pulse should have more energy to get high strength reflected echo since it gets attenuated during transmission.

$$R_{res}=\frac{C}{2B}$$

Where, c = speed of light and

B = bandwidth of the pulse

Signal to noise ratio is defined as ratio of signal power to the noise power and it is expressed in decibels(dB).

$$\text{SNR} = \frac{p_{signal}}{p_{noise}}$$

1.1. Methods of pulse compression

M. I. Skolnik, 'Radar Handbook,' 3rd edition, Mc Graw Hill 2008 gives new

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MINIMIZATION OF SPECKLE NOISE FROM POLARIMETRIC SAR DATA

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ABSTRACT:

Polarimetric Synthetic Aperture Radar [POLSAR] is an advanced imaging radar system which emits electromagnetic pulses and receives echo signals reflected by ground objects in order to obtain scattering characteristics of ground target objects.

Synthetic aperture radar (SAR) data is mostly effected by speckle noise. Speckle noise occurs due to coherent returns from many scatters present on the earth surface which cause difficulties in interpretation and analysis during image processing. Speckle suppression in SAR data is important for extraction of meaningful information for PolSAR images.

This paper proposes minimization of speckle noise from PolSAR data by using set of speckle filters such as boxcar, median, refined lee, idan. The performance can be measured by calculating certain parameters such as mean square error(MSE), peak signal to noise ratio(PSNR), standard deviation to mean(SD/M), edge preservation index(EPI), equivalent number of looks(ENL).

Keywords:

Synthetic Aperture Radar(SAR), Polarimetric SAR(PolSAR), speckle noise.

INTRODUCTION:

For remote sensing applications and information regarding monitoring natural features and changes on earth surface, Synthetic aperture radar (SAR) technology plays major role.

In order to obtain high spatial resolution in terms of image reflectivity properties, initially systems employed a single channel configuration. The multi-dimensional SAR system provides the maximum amount of information present on earth surface.

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POTHOLE DETECTION SYSTEM USING IoT

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Abstract **- The roadways constitute the major part of the transport system, but the major drawback in hassle-free road transportation in the presence of potholes which are formed due to heavy rains and vehicle movement. Due to the presence of potholes, large numbers of road accidents take place in India every year. To overcome this fatal problem of accidents on roads the accident detection system can be used to save the lives of the injured people by spotting the accident-location and alerting the nearest ambulance. But there is always a chance of life-loss. Instead, the emphasis should be on preventing the pothole-caused accidents by locating the potential potholes. This project aims to produce a pothole detection and notification system. Our proposed model mainly deals with detection of potholes using vibrational techniques in which sensors like accelerometer, ultrasonic sensor and Arduino etc. are employed to detect a change in the motion of the vehicle. Once a pothole is encountered, the detected location is determined using a GPS module and sent to the cloud storage which can be informed to the road authorities for repairing if needed.**

Keywords **-** Potholes, Ultrasonic sensor, Accelerometer sensor, Arduino UNO, GPS module, Cloud storage.

I. INTRODUCTION

The development of a country is measured with the condition of its roads and their maintenance. Good road conditions offer an ease in transportation and ensures the dynamic nature. But, road accidents, which occur due to a variety of reasons, pose a major problem in smooth operation of transportation system. One such reason which brings hurdles in a hassle-free road transportation is the presence of potholes, which multiplies the risk of such accidents. Hence it implies to the need for an immediate repair of potholes by the authorities.

The increase in the number of pothole caused road accidents often leading to fatal injuries, poses a need for an urgent solution to the problem. According to a survey, a total of 3597 deaths occurred due to potholes in the year 2017 and the count is increasing every year. This requires efforts from the government side to be more cautious. Moreover, providing pothole location information to the government officials will help them in repairing the damaged roads which can bring down the count of pothole caused casualties. A lot of research is presently being carried out to estimate the road surface to determine the presence of potholes. To achieve the same, there are two different approaches, which include, the vision- based approach and the vibration-based approach. Out of the two, the vision based technique revolves around capturing the road images and applying complex image processing algorithms to detect the potholes. The vibration-based approach or the sensor-based approach deploys the usage of sensors to detect the potholes by actually passing through it. This method can also be used to determine the intensity of pothole apart from just detecting them. One advantage of this over the other is, it doesn't require complex algorithmic approach or large processing power.

The project's hardware consists of an Arduino-based sensing model working with ultrasonic sensor and accelerometer sensor or g-sensor. Based on the sensor data, the pothole locations can be determined and sent to a cloud storage, which can be accessed by the government officials in order to rectify them.

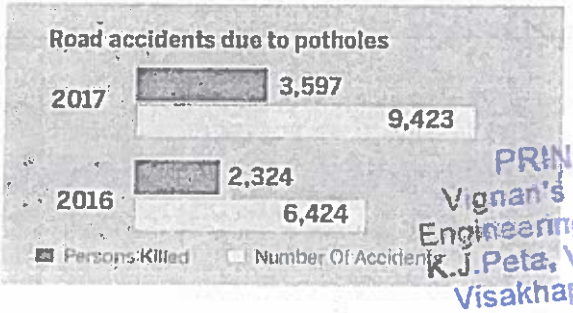

Fig.(1) : An increase in the number of pothole- caused accidents in two successive years

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Estimating RCS for Perfectly Conducting Sphere at Different Frequencies and RCS Reduction Techniques

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Abstract—**In Radar Systems, stealth technology plays a vital role in hiding targets from the radar. In stealth, the analysis and discrimination of targets depend on the calculation of the Radar cross-section (RCS). This paper computes the Radar Cross Section of various objects like Rectangular, Triangular flat plates, Cylinder and Sphere. The results show that objects with spherical surface provides poor reflection compared to remaining objects and it finds major application in the field of stealth. The RCS is measured for a perfectly conducting sphere using Spherical polar scattering geometry (SPSG) method by calculating scattering coefficients to observe the scattering mechanism at various frequencies and diameters. Later, the methods for controlling RCS and penalties for implementing these methods are also discussed. Simulation results were obtained for RCS at various frequencies and diameters using MATLAB tool.**

Keywords—**Diameter; Radar Cross Section (RCS); Radar Cross Section Reduction (RCSR); Spherical polar scattring geometry.**

I. INTRODUCTION

The radar system uses RCS as the main character to discriminate against various objects or targets in stealth technology. Therefore, accurate prediction of target RCS is critical to design and develop robust distinct algorithms.It is important to understand the significance of RCS prediction rather than RCS calculation methods used to develop RCS reduction techniques. RCS prediction methods can be of two types one is an exact method and the other one is the approximate method. Exact methods of RCS prediction are very difficult even for simple objects which carry through Maxwell's equations based on boundary conditions. An alternative method is an approximate method that calculates RCS in dB. Approximate methods commonly employ the source for evaluating RCS of complex targets such as ships, missiles, and aircraft.

Stealth technology is also termed Low observable technology (LOT). It plays a major role to make targets unseen by enemy radar. Stealth means to avoid the detection or try to hide, for airplanes, hiding from radar meant stealth. It uses the principle to absorb and reflect the radar waves. In Stealth technology there are many signatures to be managed for target discrimination such as visibility, acoustics, measuring (RCS), thermal, etc. Signatures are a type of character where weapon systems may be detected, recognized and engaged. Modifying these signatures can improve the survivability and effectiveness of military or navy systems. Stealth is a group of techniques, which makes finding and attacking a system harder. Stealth can be achieved by reducing active and passive signatures. Active signatures are all the observable emissions from a platform: acoustic, chemical, radar, and UV, etc., whereas Passive signatures are observables on a platform that require external illumination: magnetic and gravitational anomalies; a reflection of sunlight and cold outer space.

II. RADAR CROSS SECTION

Radar cross section (RCS) is a measure of the power scattered from a target towards the radar when the target is illuminated by the electromagnetic radiation i.e. how detectable an object is by radar. Larger the RCS more easily an object can be detected. It is also defined as the ratio of backscattered power per unit

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ALCOHOL DETECTION AND AUTOMATIC ENGINE LOCKING SYSTEM USING ARDUINO MEGA 2560

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Abstract - **The purpose of this project is to figure out the problems of loss of life and property due to drunken driving by developing a vehicle accident prevention system. The Arduino board is integrated with the Alcohol Sensor (MQ3) which detects the presence of Alcohol concentration of the driver by analyzing his/her breathe and is also integrated with a buzzer to alert people, an LCD to display a warning message, a motor to demonstrate engine locking mechanism, a motor driver IC module to control the operations, behavior of the motor. And As soon as the presence of Alcohol is detected in the drivers breathe, the engine of vehicle is halted gradually with some delay i.e. the speed of the engine reduces gradually and then gets halted, the emergency siren (buzzer) is blown and a warning message is displayed along with the amount of alcohol concentration which is detected by the MQ3 sensor, through liquid crystal display (LCD). Thereby minimizing any disasters that could have happened to evade the loss of property and life due to drunken driving.**

Keywords - MQ3 sensor, Arduino MEGA 2560, L298 DUAL H- BRIDGE DRIVER MODULE, engine locking, alcohol detection.

Abbreviations: LCD- liquid crystal display; DC motor- direct current motor; IDE- integrated development environment; IC- integrated circuit; USB- universal serial bus.

I. INTRODUCTION

Now-a-days road accidents are considered as a sizable problem all over the world. Every year people in numerous amounts are killed or injured on road as the driver was under the repercussion of alcohol and it diminishes the human ability to determine distance, response time and vision. Most of the accidents occurring at the city outskirts are due to drunken driving and none of advance technique in vehicles detects the alcohol concentration in driver's breathe.

In our project, the implementation is done accordingly to solve this problem by designing a system which can be termed as breathe analysis, as it analyze the alcohol content from person's breathe and switches OFF the vehicle engine automatically whenever alcohol of certain quantity is detected which can be termed in short as "AUTO LOCK" system.

This system consists of MQ3 gas sensor (Alcohol sensor) which is suitable for detecting alcohol content when placed in the contiguity of the driver from his/her breathe. The surface of the sensor is sensitive to various alcohol concentrations and this sensitivity can be adjusted as per the requirements.

This system when implemented in vehicle will not only avoid the deaths but also helps in minimizing total number of road accidents which occurs due to drunken driving. Even though efficient setup have been adopted in the traditional methods, it may not

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Power Efficient Shift Register Using Leakage Control NMOS Transistor

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Abstract- VLSI is a stream of electronics engineering which involves putting millions and billions of transistors logically together on to a single chip. VLSI circuits play a vital role in modern digitalized world. FLIP-FLOPS (FFs) are the fundamental storage elements used in digital system designs, which constitutes registers, shift registers, counters etc. The powerdissipation of the FFs employed in a typical digital design has a great influence on its performance. This paperpresentsthe design of a SISO (Serial In Serial Out) register using LCNT(Leakage Control NMOS Transistor) based D Flip Flop. The functional verification is done in mentor graphics tool. The obtained results matching with the expected ones and the comparative analysis with the previous design techniques shows that thiswill be an effective solution for the future low power register designs.

Keyword: LCNT, SISO

I INTRODUCTION

In today's electronics world, there is a drastic change in the size of devices. This led to the development of VLSI technology. It allows as design of circuitswith less power, portability and mobility, with less cost and less environmental effects. FLIP-FLOPS (FFs) are the fundamental storage elements in digital system designs and they find applications in registers, shift registers, counter etc. The 20% - 45% of the total system power is from these basic storage elements. Therefore while designing registers, counters etc. the power dissipation of a flip flop is the major performance limiting constraint. In a classic design model the major limitation of flip flops in VLSI designs is power consumption, power dissipation, delay, clock skew etc. On concern with limitation power dissipation is one of the important constraints which reduce the speed of the device, reliability etc. Our motive is to reduce the power dissipation using different low power techniques. Using these flip flops we would like to design shift registers.

Shift registers are widely used in large number of sequential circuits and processors for temporary storage of data. A shift register is cascade of flip flop, sharing the same clock, in which the output of each flip flop is connected to data input of next flip flop in chain. Serial in Serial Out (SISO) shift register accepts data serially, one bit at a time at the single input line, and shifted to next flip flop serially. The output is also obtained on a single output line in a same serial fashion.

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19-20-(6)

DESIGN AND IMPLEMENTATION OF VEHICLE THEFT AND TRACKING SYSTEM

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Abstract - Currently, the use of vehicle is essential for everyone. In the same way safeguarding the vehicle against theft is also essential. Recently, vehicle tracking system is getting vast popularity because of rising number of the stolen vehicles. Vehicle tracking and locking system is installed in the vehicle, to track the location. The location of the vehicle is identified by using Global positioning system (GPS) and Global system mobile (GSM).

When any kind of theft is identified, the responsible person sends SMS to the micro controller, then micro controller issues the control signals to stop the engine motor. This is more secured, reliable and low cost.

Index Terms - Arduino UNO, GSM Module, GPS Module, Fingerprint Sensor, Smart phone

I.Introduction

In the last few decades, the development of satellite communication technology is easy to identify the vehicle locations. Vehicle tracking systems have brought this technology to the day-to-day life to the common person. Today GPS is used in cars, ambulances, fleets and police vehicles are common sights on the roads of developed countries. All the prevailing technology support tracking the vehicle place and standing . The GPS/GSM based system is one among the foremost important systems, which integrate both GSM and GPS technologies. It is necessary thanks to many applications of both GSM and GPS systems and therefore the wide usage of them by many people throughout the planet .

Currently GPS vehicle tracking ensures their safety as travelling. This vehicle tracking system found in clients vehicles as a theft prevention and rescue device. This system installed for the four wheelers. Vehicle tracking systems accepted in consumer vehicles as a theft prevention and retrieval device. If the theft identified, system sends the SMS to the vehicle owner.

This tracking system can store the whole data where the vehicles had gone, where it stopped, how much time it takes at every stop and can create whole data analysis. It can also used in buses and trains, to estimate how far are they, how much time it takes for them to come to particular stop. These systems are used to data capture, data analysis and finally data transfer.

II. Literature Survey

Different anti-theft systems are developed over the past few years. In this system has been developed based on micro controller that consists of a GPS and GSM. A two way communication process is achieved employing a GSM modem. This study also comprises of a bio-metric protection system of the vehicle and fingerprint verification of the driving force of the vehicle is employed to guard the vehicle from anti-theft.

Fingerprint recognition or fingerprint authentication can be defined as a method of verifying a match between two human fingerprints in an automated behaviour. Fingerprints are one among many sorts of bio metrics wont to identify individuals and verify their identity. When driver gives his verified fingerprint image before starting the vehicle, the system are going to be considered as fair condition. But when vehicle's location is modified

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VEHICLE ACCIDENT DETECTION SYSTEM WITH EMERGENCY NOTIFICATION

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Abstract- The rapid growth of technology and infrastructure has made our lives easier. The development of technology has also increased more number of fatal and disabling road accidents day by day.Life of the people is under high risk. This is because of the lack of best emergency facilities available in our country.Our project aims in developingArduino Based Vehicle Accident Detection System using GPS, GSM and Vibration sensor. Vibration sensor detects the vibration of vehicle and GSM module send the alert message to the emergency contact numbers. The message is sent through the GSM module and the location of the accident is detected with the help of the GPS module. It also reduces the response time of emergency services through the efficient communication of relevant information about the accident.Thus immediate medication will be provided to the accident victims in the remote areas.

Index Terms- Arduino UNO, GSM Module, GPS Module, Vibration Sensor, Smart phone

I. Introduction

In today's world there is a severe increase in the use of vehicles. Such heavy automobile usage has also increased the traffic hazards and thus resulted in rise of road accidents. Life of the people is under high risk. This is because of the lack of best emergency facilities available in our country. Proposed system makes an effort to provide the emergency facilities to the victims in the shortest time possible. This design is a system which can detect accidents in significantly less time and sends the basic information to emergency contact numbers within a few seconds covering geographical coordinates i.e. latitude and longitude of vehicle at which the accident had occurred. This alert message is sent to the emergency contact numbers in a short time, which will help in saving the valuable lives. The message is sent through the GSM module and the location of the accident is detected with the help of the GPS module. The accident can be detected precisely with the help of vibration sensor. The immediate medication will be provided to the accident victims in the remote areas. However, we cannot limit the increasing number of transportation but we can limit the fatal road accidents deaths with timely and effective communication of these accidents to hospitals, police and family members. Our system aims to develop Smart road accident detection and communication system using GPS and GSM technology and also to reduce the response time of emergency services through efficient communication of relevant information about the accidents.

II. Literature Survey

At present criteria, we cannot detect where the accident has occurred and hence no information related to it, leading to the death of an individual. The existing technique is Deep learning based Internet of vehicle system. The existing technique is to detect vehicle accident along with the GPS

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INTEGRATED MACHINE LEARING WITH REGION BASED ACTIVE CONTOUR MODELS IN MEDICAL IMAGE SEGMENATION

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ABSTRACT: Now a days people are mostly affected by tumors.so, the main aim of this paper is to identify the tumor in a body and detecting the nearest area effected and that will be done by using machine learning with region-based active contour models, region based active contour model is effective in segmenting images with poorly defined boundaries but often fail when applied image containing intensity inhomogeneity.

Machine learning algorithms are highly effective in handling inhomogeneity, but often result in noises from misclassified pixels. In addition there is no objective function. Therefore, proposed a framework which integrates the machine learning with region based active contour. The integration of the k-nearest neighbors and the support vector machine with the chan-vese method, and by comparing this result with the traditional method of chan-vese method. Better accuracy, speed and less sensitivity to parameter tuning which are being observed in this paper.

INDEX TERMS: Machine learning, active contours, medical images, segmentation.

I. INTRODUCTION

Image segmentation plays a significant role in computer vision and medical image processing. Numbers of segmentation methods are proposed but none is universally applicable. A number of modern approaches using the energy minimization for image segmentation have been worked, starting from the snake model introduced by KASS et.al. A popular energy minimization approach is the level set method (LSM)[1], which is widely used in medical image analysis and it was subsequently applied to image segmentation .Generally, existing image segmentation using level set methods can be grouped into two categories: Edge-based models and Region based models[2]-[3].

Edge-based model:

Edge detection is an image processing technique for finding the boundaries of objects within images. It works by detecting discontinuities in brightness. It is used for image segmentation [4] and data extraction in areas such as image processing, computer vision and machine vision. Common edge-detection algorithms include Sobel, Canny, Prewit, Roberts and fuzzy logic methods

Region based model:

Region based methods are depended on continuity. These techniques divide the entire image into sub regions depending on some rules like all the pixels in one region must have the same Gray Level. Region-based techniques rely on common pattern in intensity values within a cluster of neighboring pixels. The cluster is said to be a region, and the goal of the segmentation algorithm is to group the regions according to their anatomical or functional roles. Compared to edge detection method, segmentation algorithm based on region are relatively simple and more immune to noise.

Objectives:

Design of Hamming Code Encoder & Decoder Using Different Techniques

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Abstract –In this paper, the hamming code encoder and decoder is designed by using Modified Gate Diffusion Input (MGDI) technique, in order to achieve error-free data transmission and reception. The MGDI technique is the most efficient research in VLSI low power design when compared to other logic styles. MGDI has a reduced number of transistors which results in low complexity in the circuit and low power dissipation. The hamming code encoder & decoder circuitsare designed by using MGDI technique and are stimulated in gpdk130 nm technologyusing Mentor Graphics ® EDA tool. The main advantage of this present paper is to design the best performance hamming code circuit using MGDI techniquewhen compared to CMOS technique.

Index Terms– CMOS, MGDI, Hamming code, Encoder, Decoder, Power Consumption

I. INTRODUCTION

The recent advancements in the portable device's development for data communication in [1] mandatorily requires low power and highspeed characteristics. But in [2] the design of VLSI circuits in the submicron technology to achieve high speed at smaller chip sizes has a serious problem of power consumed in the digital circuits.By improving the performance of digital circuits using traditional CMOS logic style has introduced different design styles such as Pass Transistor Logic (PTL),Transmission Gate Logic (TGL), etc. In [4,5]Pass transistor logic is achieving minimum power. [6] presents various circuit logic styles for designing multipliers to achieve accurate circuit performance in terms of low power, speed, and smaller area. [9]presents the MGDI technique is the best choice for achieving accurate system performance with low power consumption and reduced number of transistors when compared to CMOS logic style.

Digital communication is an effective way of data transmission in electronic communication. But the data is corrupted by external noise or physical failures. In such a situation, the information, which are present in the data is lost. For controlling the errors which is present in data by using different error controlling codes such as parity checking, checksum error detection, cyclic redundancy check, VRC, LRC & Hamming code.Comparing with other error controlling codes, hamming code has high efficiency for error detection as well as for error correction to achieve error-free transmission and reception with high accuracy presents in [14,15]. It is used in platforms like computer memory modems, embedded processors and Nanosatellites. It also plays a major role in satellite communications, telecommunications, and embedded applications. But it is only used to detect and correct the single-bit error. By using the SEDC-DED algorithm, a single-bit error is corrected and double-bit error is detected.This paper presents the design of low power based Hamming code encoder and decoder using MGDI logic.

In this paper, Section II presents the design principle of MGDI techniques. In Section III, the generation of Hamming code for a 4-bit data including circuit implementation of encoder and decoder is presented. Section IV presents the Simulation waveforms and comparison results. Conclusions and future work are discussed in Section V

II. MODIFIED GATE DIFFUSION GATE(MGDI) TECHNIQUE

The basic logic cell for implementing the MGDI technique is derived from CMOS basic inverter as shown in Fig. 2. For developing the logic cell for the MGDI technique, basic CMOS inverter operation is considered with one input(X) and one output(Y). The Boolean equation developedforthe operation of CMOS inverter can be expressed as,

$$Y = V_{dd} \text{ or } Gnd \quad (1)$$

Equation (1) concludes that the output is defined to be either Vdd or Gnd.

The output can be elaborated as follows when the input is applied as follows:

$$Y = V_{dd}, \text{ when } X=0 \quad (2)$$

$$Y = Gnd, \text{ when } X=1 \quad (3)$$

The output Y of the inverter is given as follows:

$$Y = \bar{X}.V_{dd} + X.Gnd \quad (4)$$

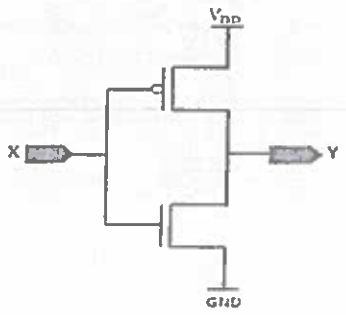

Fig. 1. Basic CMOS inverter

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Theoretical studies on D-A-π-A and D-(A-π-A)$_2$ dyes with thiophene-based acceptor for high performance *p*-type dye-sensitized solar cells

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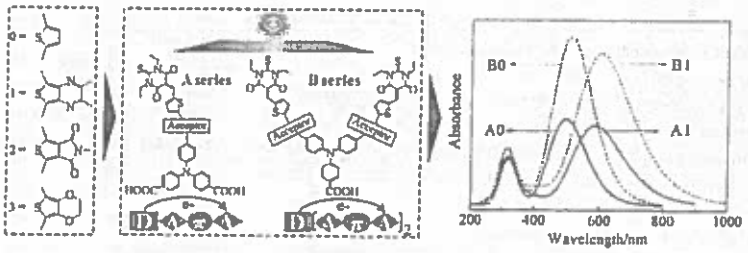
HIGHLIGHTS

- Three thiophene-based acceptors modify the *p*-type D-A-π-A prototype dye.
- Three thiophene-based acceptors modify the *p*-type D-(A-π-A)$_2$ prototype dye.
- 2,3-dimethylpyrazine thiophene increases red shift and absorption of sunlight.
- The additional -A-π-A chain in D-(A-π-A)$_2$ improves the DSSCs performance.

GRAPHICAL ABSTRACT



ARTICLE INFO

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Thiophene derivatives
DFT

ABSTRACT

Eight *p*-type dyes with D-A-π-A or D-(A-π-A)$_2$ structures were designed to investigate the effect of thiophene derivatives acting as acceptors on the properties of the sensitizers. Structure optimizations were performed by the density functional theory (DFT) method, and the electronic and absorption characters were obtained with the time-dependent DFT (TD-DFT). The results show that all the eight dyes have an excellent light harvesting efficiency (LHE) performance (0.99–1.00). And the driving forces of hole injection (ΔG_{inj}) and dye regeneration (ΔG_{reg}) of all dyes are more negative than −0.2 eV, resulting in an efficient hole injection and dye regeneration. Furthermore, the dyes with 2,3-dimethylpyrazine thiophene moiety (DMPZT-1) have the narrowest energy gaps. Importantly, the dyes with DMPZT-1 moiety display red shifts of the UV–vis absorption and enhanced absorptions of visible light (400–800 nm) in comparison to their prototype. In addition, the charge recombination (ΔG_{CR}) performance of A1 and B1 is improved by DMPZT-1. Compared with the D-A-π-A dyes, the additional -A-π-A chain in D-(A-π-A)$_2$ could decrease energy gap further and improve the visible light adsorption, LHE, and driving forces for hole injection and charge regeneration (ΔG_{inj} and ΔG_{reg}). Replacing thiophene with DMPZT-1 acceptor is an effective way to improve the performance of the dyes.

1. Introduction

Dye-sensitized solar cells (DSSCs) have attracted great attention after O'Regan and Grätzel's report about the sensitization of a *n*-type semiconductor TiO_2 [1], because of their low cost, high efficiency and environmental friend. The DSSCs is worthy of attention since *n*-type and *p*-type DSSCs can be incorporated into a tandem cell [2]. The theoretical maximum power conversion efficiency (PCE) of tandem cell is

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WATER QUALITY ANALYSIS AND NOTIFICATION THROUGH IoT

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Abstract

This paper represents an IoT based water quality monitoring system that continuously monitors the physical and chemical parameters of the water (i.e, pH, turbidity). The micro controller senses the PH, turbidity values from the sensors and sends them to the Think Speak through the Wi-Fi module and as well as it will be displayed on LCD. Think Speak can send data to the cloud to store data in a website. This system also provides an alert to a remote user by using the GSM module, whenever the obtained values don't meet the requirements of WHO standard values.

Keyword: PH sensor, Turbidity sensor, Arduino UNO Wi-Fi module, GSM module, LCD.

.Introduction

Water pollution is the biggest threat for green globalization. Water is the primary source of human beings to live. But due to excessive pollutants, water safety is getting reduced.Poor water quality spreads diseases and may cause death. Around 5million people are affected due to waterborne diseases. Industrial and factory waste products are released into rivers and lakes causing water pollution. Therefore there is a need to continuously monitor the quality ofwater.

Water quality monitoring literature's aimed at alerting the user in the form of SMS about water quality using GPRS/GSM module. Such systems don't allow us to store and retrieve the data that is monitored . The methods that are used previously for water quality monitoring lacks the availability of data for all the users and is limited to a single user. To overcome the limitation, the proposed work uses IOT based water quality monitoring system that makes the measurements available in the cloud and is accessible to everyone required.

II. Literature Survey

Kamal Alameh, 2011 presented a web based WSN for monitoring water pollution using ZigBee network. The system measured various Water quality parameters. It collected, processed, measured data from sensors, and directed through Zigbee gateway to the web server to monitor quality of water from large distances. The limitation with Zigbee network is its range as it covers 10-100meters.

Dong He, 2012 developed the WQM system based on WSN. The remote sensor was based on Wimax network. WSN tested Water quality parameters and sent data to the Internet using GPRS. With the help of the Web, information was gathered at a remote server. But the disadvantage with Wimax is accessing data is limited to a radius of 30 miles(50km).

Nikhil Kedia entitled "Water Quality Monitoring for Rural Areas-A sensor cloud based economical project" which highlights water quality monitoring methods, embedded design and information dissipation procedure, type of sensors which can be used & the role of government in rural areas. The paper also gives information on how the idea can be implemented using the Sensor Cloud domain published in 2015 first International conference on next generation computing technologies (NCGT-2015) Dehradun, India.

Vennam Madhavi Reddy and B.Koteswara Rao entitled "Smart Water Quality Monitoring System Using IoT Technology"Microcontrollerandtheprocessedvaluesremotelytothecorecontroller ARMwithaWI-FIprotocolare

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Comparison of Salience and Statistical Fusion Techniques

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Abstract – **Multifocus image fusion is to integrate the partially focused images into a single image by extracting the important information from both the focused images effectively. As the demand increases for the Multifocus image fusion many algorithms have come into the scene. Here in this paper, a comparison is being done between two fusion techniques, i.e., the saliency-based and the statistical-based fusion.**

Index Terms – **Average-Gradient based saliency detection method, Local Binary Pattern, Multi-focus image fusion, Saliency detection method, Subjective and objective analysis.**

I. Introduction

The improvement in the quality of the image is an important task for the process of image fusion. Image fusion is a subfield of image processing where two or more images are fused to obtain an image which is focused everywhere [1]. Multi-focus image fusion is one in which combines all the information from multiple focused images of the same scene to produce an image which visually perceived and of high quality. Currently, Multifocus image fusion is widely used in object recognition and microscopic imaging.

In recent years many effective multi-focus image fusion techniques have been proposed. These methods can be classified into two categories: the transform domain and the spatial domain [1],[2]. In the transform domain, the source images are first converted into the transform domain then the fusion rules are structured to combine the transform coefficients. Finally, the inverse transform is performed to obtain the fused image [2]. Whereas in the spatial domain it directly deals with the pixel values. Here the Pixel values are directly manipulated to get the desired outputs [2]. There are various methods present in the spatial and transform domain from simple ones like average method, the maximum method to complex techniques like NTSC, local frequency-based method, content-adaptive blurring and so on. To effectively fuse the multi-focused images, the features which it should have are first, good clarity levels or quality levels, and second, the sensitivity of low contrast area must be noteworthy.

Saliency based image fusion and statistical-based image fusion are two effective methods for real-time image fusion which help to retain the edge information and the image quality. Here in this paper for saliency-based fusion, two methods are used, the average gradient-based saliency method and the saliency detection method, whereas for the statistical-based fusion Local Binary Pattern is used

II. Saliency Based Image Fusion

Saliency refers to the 'degree of objects' stimulation of the human eye. The human visual system can detect visual saliency fast and reliably. The saliency of an item be it an object, a person, a pixel, etc., is the state or quality by which it stands out relative to its neighbours. Saliency detection [3],[4] is considered as the main mechanism that facilitates learning and survival by activating organisms to focus their

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AN ADJUSTABLE WINDOW BASED FIR FILTER AND ITS APPLICATION IN AUDIO SIGNAL DE-NOISING

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Abstract:

A New window function is proposed, which can be used to design a low pass FIR filter. The window is adjusted by changing the values of a variable and it consists of a linear phase response indication. The output of the proposed window-based filter shows higher ripple ratio, main lobe width, side lobe roll-off ratio than the Gaussian filter. Kaiser filter and improved side lobe roll-off ratio than the Tukey filter. Furthermore, all the mentioned filters have been applied on a noisy audio signal and it has been observed that the filter which has been de-noising the noisy audio data in a better way where the result illustrates that the proposed window-based filter is showing better signal to the noise ratio than the Gaussian filter as well as higher signal to noise ratio over Tukey, Kaiser filter and another proposed window based filter respectively.

Keywords: FIR filter; window based filter; audio signal processing; side-lobe roll-off ratio.

1. INTRODUCTION

FIR filters are used for noise correction as well as state estimation. The cost of hardware for FIR filter is measured based on the number of adders. FIR filters have properties like bonded input /bonded output stability, low sensitivity to round-off error and more importantly unbiased finite impulse response to ignore noise. Using FIR filters different estimation problems have been solved in state space. The digital FIR filter is also employed to diminish out-of-band noise. As an instance, in microphone, the signal is filtered by an optimized FIR filter. In general, mostly used adaptive filters are FIR adaptive filters. The mostly used methods for designing FIR filter are Kaiser, Gaussian and Tukey. Audio signal processing are the applications of FIR filters due to their side-lobe roll-off ratio. Furthermore, space the foreign interferences can be rejected

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GSM AND GPS BASED FIRE AND GAS LEAKAGE ALERT SYSTEM

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Abstract- In today's world, the effects of accidental fires, gas leakage and explosion can be disastrous, so an advanced alert system need to be designed. The previously proposed alert systems used alarms for warning and send an SMS alert to the user or owner. But these systems were less useful, since the user or owner himself has to provide information about the accident to the fire station. In this paper, we proposed a system which consists of a GPS module and a GSM module interfaced with Arduino UNO. This system not only sends an SMS alert to the owner but also sends an SMS along with the location of the incident to the fire station. It is also equipped with a gas sensor to detect gas leakage and a flame sensor to detect the explosion and fire. A provision is also provided where it can control the circumstances to some extent using exhaust fans and solenoid valve.

Keywords: Arduino UNO, GPS module, GSM module (SIM900A), MQ-5 gas sensor, IR flame sensor

I INTRODUCTION:

Detection of fire and gas leakages is major issue for all spheres of lives where precautions need to be taken. These fire outbreaks may occur due to negligence of the people or it may even occur due to short circuits. The usage of LPG (Liquefied Petroleum Gas) as a fuel has been increased in the present days. It is used in gas cylinders in highly concentrated state and blasts of these cylinders can be devastating in terms of lives lost and property. To avoid such situations a fire and gas leakage alert system is needed. So here, we proposed a system where it alerts the user and fire station about the accident and control the circumference to some extent.

In 2016, Dhruvajyoti Paul and her team [1] proposed 'GSM Based Fire Sensor Alarm using Arduino' where they used flame sensor for detection of fire and GSM modem for sending alert messages to the user, police station and fire brigade through the mobile cellular network. In 2018, Rupali S. Gajare [2] proposed 'Home and Industrial Safety System for Fire and Gas Leakage Detection' where they used flame sensor for detection and buzzer for alarm. Depending on the gas sensor output, the microcontroller sends message to the authorized user. In 2019, D. Divyasree proposed 'Gas Monitoring System using Arduino'. In this a gas sensor along with a servo motor is used to detect gas leakage in different directions. An alarm is used to alert the people and to notify the user by connecting via IoT software using Blink app. Pritam Gosh and Palash Kanti Dhar proposed 'GSM Based Low-cost Gas Leakage,

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REMOVAL OF NOISE IN ECG SIGNAL USING FILTERING TECHNIQUES

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Abstract-- An electrocardiogram (ECG) is a graphical interface that shows its implication for the diagnosis of various cardiac problems by recording the electrical activity of the heart with respect to time. The amplitude and time of the ECG signal are corrupted by noises and artifacts during data acquisition. The main noise sources are baseline wandering, EMG noise (Muscle noise), motion artifacts, power line interference in ECG. The noise can be reduced by designing FIR low pass and high pass filters using window methods like Chebyshev, Tukey, Taylor, and Kaiser.The Electromyogram (EMG) noise can be removed perfectly by the FIR Chebyshev filter algorithm. Savitzky-Golay filter is applied to eliminate the baseline wander and motion artifacts noise in the signal. Mean square error (MSE) is used to estimate signal goodness. Thresholding the peaks of the QRS-complex is very important where it corresponds to the depolarization of the right and left ventricles of the human heart.

KEYWORDS: Electrocardiagram (ECG), FIR Window Techniques, Electromyogram (EMG) noise, Mean square error(MSE), Savitzky-Golay filter.

I. INTRODUCTION

Electrocardiogram (ECG) is a nearly periodic signal that reflects the activity of the heart. A lot of information on the normal and pathological physiology of heart can be obtained from ECG. However, the ECG signals being nonstationary in nature, it is very difficult to visually analyze them. Thus the need is there for computer based methods for ECG signal Analysis.

ECG wave consist of some distinct features such as P-wave, QRS- complex and T- wave, sometimes U-wave is also present. Each of these feature waves is the result of the specific electric activity of the heart. P-wave occurs due to atrial depolarization. QRS- complex is the result of ventricular depolarization and ventricular repolarization results in formation of the T-wave. Each of these waves has the characteristics amplitude and time period when considering the normal heart beat. So, if any abnormality is present in any parts of the heart, it reciprocates in the ECG waveform [1].

An ECG is very sensitive, different types of artifact and interference can contaminate the ECG signal as the real amplitude and time period of the signal can be changed. ECG signals are mostly affected by Electromyogram noise, Power-Line interference noise (50-60)Hz,

An Efficient Transaction Memory Storage Management Model for Images

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Abstract—Transaction Memory Management Model is a structureless virtual file system from which complex databases can be built. This system works only on images which can be further extended to heterogeneous data. Because of its simple flat structure, a more complex storage engines or file systems with an internal structure as required by the user can be developed. It supports full transactions and creates an exact storage that fits the data without wastage of memory.

Keywords—*Virtual file system, Flat structure, Complex storage*

I. INTRODUCTION

The data is increasing data by data. Due to increase in data, data storage Management plays a vital role. There are numerous number of file systems to store data. But, storing of data in an efficient manner is a key challenge. Transaction Memory Storage Management Model is a structureless virtual file system that will store the data in a single master file within the streams.

Transaction Memory Storage Management Model will create an exact storage that fits the data without wastage of memory. This system works only for images with different formats (jpg, bmp, tif and png) and these images are stored in the form of streams in which each stream is referenced with stream Id. It allocates data when the streams are enlarged and deallocates when the streams are shrunk.

II. LITERATURE SURVEY

Many researchers who carried out exploration in storage management field have concentrated more on cluster based architecture while this proposed work being is focused directly on storage system for large complex data which is structureless virtual file system.

There are many distributed file systems like HDFS and GFS. HDFS stands for Hadoop File System, which holds large amount of data. HDFS stores file system metadata and application data separately [6]. HDFS has master/slave architecture [3]. Each file is divided into blocks and replicated among the nodes [2]. HDFS contains two nodes namely DataNode and NameNode [4][5][10]. The Default Block size in HDFS is 128MB [10]. Each NameNode maintains the metadata of data block and the information of the data block on which the primary replica and secondary replica are stored. But, In this file Model if the data to be stored is 1MB then the complete 128MB of the block have to be allocated. GFS stands for Google File System which is a scalable distributed file system developed by Google [1][8].GFS cluster consists of single master and multiple chunk servers[7]. Even GFS contains the files that are divided into chunks which maintain replicas that are present in different chunk servers. The default block size of GFS is 64MB.

III. PROPOSED METHOD

The main purpose of Transaction Memory storage management model for images is to create an exact storage that fits the data without wastage of memory which cannot be achieved through any other file systems. This consists of a master file in which all the images are stored in the form of streams. Each stream can be referenced with a stream Id which is a type of Guid.

A. Segmentation

The master file is divided into variable length segments. Each stream can be composed of one or more segments that are chained together. Segments that mark the free spaces are also chained in a stream called free space stream.

PoLSAR IMAGE CLASSIFICATION USING CONTEXT BASED MAX-MARGIN

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Abstract: Synthetic aperture Radar is a two-dimensional radar or three-dimensional radar.It plays an important role in remote sensing.After many researches have been done the advanced radar is polarimetric synthetic aperture radar (PolSAR). PolSAR radar is a fully polarimetric radar it provides useful information on describing observed targets than traditional synthetic aperture radar. Therefore it plays an important role in many fields such as agriculture, military and geology.

This paper presents a novel discriminative model named context based max margin to perform the classification for PolSAR image. Based on this classification, ISODATA and minimum distance classification are used to describe the spatial and spectral information of polarimetric synthetic aperture radar. The first step is to make the spatial information used for pre-processing stage. The PolSAR image is formed with decomposition used to produce superpixels and then date is estimated. The second approach is to use spatial information for post-processing it support the minimum distance classification .The result is obtained by minimum distance classification. The third approach is uses spatial information directly for classification. In this method, SENTINEL data is applied to classify the PolSAR image. This SENTINEL data is classified by using SNAP software

On the basis of Max-Margin the characteristic function is designed and conditional random field is employed to propagate the contextual information in both labelling field and observation field. Spectral term and spatial term are two important parts of the model.

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Analog Pulse Compression Technique with Improved SNR and Reduced Sidelobes

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Abstract: **Pulse Compression is a signal processing technique used in radars to increase Signal to noise ratio and range resolution. In this paper we discuss about Linear frequency modulation (LFM) and Non-linear frequency modulation (NLFM). In this pulse compression can be done by using Matched Filter. In this paper we calculated the peak side lobe ratio. By using matched filter and transversal filter, order N like Hamming window, Hanning window, Kaiser window, Blackman window we increase the signal to noise ratio (SNR) and reduces the side lobe level. The Non-linear frequency modulation (NLFM) provides high signal to noise ratio compared to Linear frequency modulation (LFM).**

Keywords: **Pulse compression, Linear frequency modulation (LFM), Nonlinear frequency modulation (NLFM), Matched Filter, Window techniques.**

1. INTRODUCTION

Radar is a system that uses electromagnetic waves to detect, locate and measure the speed of reflecting objects such as aircraft, ships, spacecraft, vehicles and terrain. Radar transmits that electromagnetic signals into free space and receives that echo signal reflected from the objects. Pulse compression is a technique used to convert long pulse into a short pulse. Because the energy content of long pulse with low peak power is same as the short pulse with high peak power. Linear frequency modulation or phase modulation increases the bandwidth of the transmitted signal. The long duration pulse strike with different number of targets and the echo is returned to the receiving antenna. Pulse compression techniques are used to

increase the range resolution and signal to noise ratio.

Range resolution is defined as the ability of the radar to distinguish between two or more targets which are placed close to each other with different ranges. In range resolution pulse width is the primary factor based on width of the transmitted pulse the degree of range resolution is defined. The amount of energy in the pulse is increased by decreasing the width of the pulse depends on the width of the transmitted pulse. hence get maximum range detection, depends on the strength of the received echo. For long distance transmission the transmitted pulse should have more energy to get high strength reflected echo since it gets attenuated during transmission.

$$R_{res}=\frac{C}{2B}$$

Where, c = speed of light and

B = bandwidth of the pulse

Signal to noise ratio is defined as ratio of signal power to the noise power and it is expressed in decibels(dB).

$$SNR = \frac{psignal}{pnoise}$$

1.1. Methods of pulse compression

M. I. Shkolnik, "Radar Handbook" 3rd edition, Mc-Graw Hill 2008 gives new

ATTENDANCE SYSTEM BASED ON FACE RECOGNITION

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ABSTRACT

Attendance is an important factor in every organization. Many biometric technologies have come into existence for posting attendance. Biometric based technologies include identification based on physiological characteristics such as face, fingerprint, iris, retina, voice. The existing biometric systems are based on fingerprints and retina. The drawback of this system is it cannot be utilized by physically challenged people and the performance can fluctuate due to dry, wet and dirty fingers. Now, we proposed a system called "Attendance system based on face recognition". It is completely based on face detection and recognition i.e., it detects the images captured by the camera and recognizes them by matching with the images in the database. Successful recognition posts the attendance so that the database can be updated automatically. It takes input as an image, processes on interesting points i.e., unique feature descriptors that helps to differentiate one from another. It generates unique patterns for an image for recognition using LBPH algorithm.

Keywords: Face detection, Face recognition, LBPH.

1. INTRODUCTION

Maintaining the attendance is very important in all organizations. Every organization has its own method in this regard .some prefer marking attendance manually using the paper or file

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Detection of Money Laundering in Online Social Networks

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ABSTRACT

In current days online social networks (OSN) have become one of the prominent roles in interchanging the information from one location to another location in the world. Virtual currency in online social networks plays a vital role in performing some financial activities like e-commerce, online games, web marketing, and foreign currency exchange. As we know that OSN users try to purchase virtual currency with their original cash and try to conduct their activities with that virtual money, this laid a path for the attackers to create some sort of attacks on the user account to collect those virtual currencies in an illegal or fake manner. The main motto of the attackers or intruders is to launch a bulk number of web sites to attract the users to exchange the virtual currency and buy those things with low cost and gain huge profit. These attacks not only lose the user financially but also try to harm the other factors of that user. In order to overcome these problems, we try to design an application that can able to differentiate the benign accounts and malicious accounts based on the operations which are performed by that appropriate user. In order to show the performance of our proposed application, we try to choose data collected from Tencent QQ, one of the largest OSNs in the world. And finally, we try to divide the accounts into three aspects like account viability, transaction sequences, and spatial correlation among accounts. By conducting various experiments on our collected database, we finally came to the conclusion that our detection method by integrating these features using a statistical classifier can achieve a high detection rate at a very low false-positive rate.

Key Words:

Online Social Networks, Virtual Currency, Transaction Sequences, Spatial Correlation, False-Positive Rate, Foreign Currency Exchange

I. INTRODUCTION

According to a well-known article social media is defined in [1], as a group of internet based applications that build on the ideological and technological foundations of Web 2.0. This is built in order to allow the users to create a new event and try to exchange the same event to users who are residing far away via social media, people can enjoy enormous information, convenient communication experience and so on, which is clearly shown on Figure 1. Even though it is more

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Vehicles Detection from Satellite Images using Digital Image Processing

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Abstract: *Automatic detection of vehicles data has been widely used in the area of traffic surveillance system where the efficient traffic management along with safety is the main concept. This project depicts the count of the vehicles present at that particular area of traffic using the data provided by the satellite. The satellite captures the image of the particular traffic junction. This satellite image is further processed in order to find the count of the vehicles. The image contains unwanted objects along with the vehicles. For that image, apply thresholding techniques to detect the vehicles and such that unwanted objects whose gray scale values are below the threshold level will be removed. The designed system converts the satellite captured image into gray scale image. This gray scale image is then converted into binary image. It is proposed to develop a unique algorithm for detecting the vehicles using thresholding techniques. If the intensity value is greater than the threshold value, 8-bit of value 255 is assigned else 8-bit of value 0 will be assigned. The edges of the objects present in the binary image will be obtained. Noise will be reduced using filters. The bright areas which are bounded will shows the vehicles present in the image. Boundary formation is useful for detecting the objects in the image. Using Blob detection method the properties of the objects are depicted and using the Moore Boundary tracking algorithm the boundaries of the objects are detected. Detecting the vehicles and finding the count of the vehicles are the objectives of this project.*

Keywords: *Segmentation, Morphological Reconstruction, Object Detection*

I. INTRODUCTION

1.1 Motivation

The increasing density of the traffic in the metropolitan cities is the major problem. The major idea is to reduce the traffic. This can be done by knowing the densities of the traffic at particular road junctions. A system is designed using Digital Image Processing techniques in MATLAB R2017a. During the last three to four decades a number of techniques have been introduced and developed in Digital Image Processing background.

1.2 Related Work

Digital Image Processing techniques are applied on various images and are processed to get required outputs. In this designed system, the input is the image of a particular road junction containing vehicles. This input must be converted to gray scale image and then to binary image. Detect the edges of the objects and fill the regions of the objects in the image. Morphological reconstruction contains the repeated steps of dilations. Then filter the noise present in the image. The boundaries of the objects can be detected using the Moore Boundary tracking algorithm. The properties of the objects can be known using Blob detection method. Finally, detection of the vehicles and the count of the detected vehicles are the required outputs.

II. TECHNIQUES

In Digital Image Processing, there are different algorithms for different techniques. Figure shows the block diagram of the vehicles detection from satellite images using digital image processing.

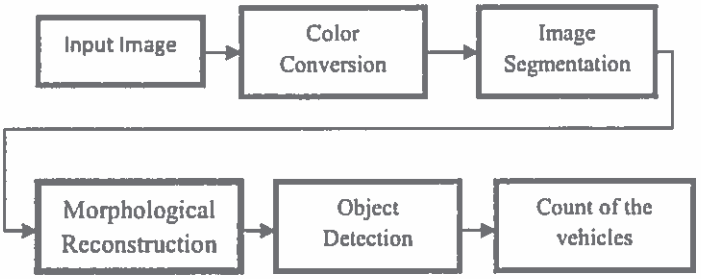

Fig.1. Block diagram of Vehicles Detection from Satellite Images using Digital Image Processing

The major techniques include image segmentation, morphological reconstruction, object detection.

Image Segmentation means partitioning an image into segments. Depending on the properties of the intensity values of the image, segmentation is classified into two types. One is segmentation based on similarities which refers the approach to partition the image into regions that are similar according to particular criteria. Algorithms used in this approach are region growing, region splitting, region merging, thresholding. Another one is segmentation based on discontinuities which refers the approach to partition the image based on abrupt changes. The algorithm included in this approach edge detection. Morphological Reconstruction is the procedure to extract the meaningful information from the images. Morphological reconstruction techniques includes region filling algorithm.Object detection refers detection of the objects present in the image. Using Blob analysis and

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India Can Become Emerging Destination for Business Opportunities: Post Covid -19 Scenario

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Abstract

The Indian economy had been booming for the past few years. The country held great promise for the future. Liberalized foreign policies had unleashed the entrepreneurial spirit of its people and many multi-national firms, attracted by the dusty plains of Deccan, had already set up big offices throughout the nation. Our cultures define our fundamental beliefs about how the world works and forms ways in which we interact and communicate with others and develop and maintain relationships. Doing business in a particular nation requires a focus on a multi-dimensional understanding of its culture and business practices. Understanding those differences and adapting to them is the key. The geopolitical changes that have taken place around the world in the last few years and the gradual changes in India's economic policies have led to a transformation in the bilateral relationship between India and the US which is best reflected in the vastly increased co-operation of the two countries in political, strategic and economic spheres. India is the world's largest democracy with a stable political environment. India has abundant English speaking, educated, skilled human resource, people within the age group of 20-40yrs, offering services at far cheaper rates than that may be found in any other developing or developed country. India is world's leader in global outsourcing with more than 80% of the market. India has at this time a young population with roughly 80% of its population below 45 years of age, etc. This article is a bird eye view of the present business scenario. Our Honorable PM Shri. Narendra Modi insists of Make in India Campaign. He fill the brain drain should stop. Proposed study is to highlight the segment wer the unemployed youth and young entrepreneurs can take over and fill the gap. Study will investigate the reasons to make India as a strong emerging market as compare to other economies of the world. Study will be focused on emerging market India with compare to China and deal with the opportunities exist in India especially.

Keywords: Indian Economy, Democracy, Trade Block, Costs, Technology

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Implementation Of A Low Power Dissipation And Area Efficient Decoder Using Mixed Circuit Logic

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Abstract- This paper briefly presents a review on VLSI line decoders by using different logic types such as complementary metal oxide semi-conductor(CMOS), transmission gate logic(TGL), pass transistor dual value logic(PDVL) and mixed circuit logic. A comparison of these techniques are represented based on their performance such as propagation delay, power dissipation and area. In order to analyze these different logic styles, a 2-to-4 decoder is considered. Simulations are done on this decoder in different logic styles as mentioned above using Mentor Graphics software. Based on the observation and analysis of the circuits, it is conveyed that CMOS logic is more robust at low power supply, TGL provides full swing in output for specific inputs, PDVL design has fast restoration capability with moderate speed and power dissipation and mixed logic provides the advantages of CMOS, TGL and PDVL. It also provides low power dissipation and area efficiency.

Keywords-; CMOS; Mixed circuit logic; TGL; PDVL; VLSI line decoders.

I. INTRODUCTION

The performance of VLSI circuits are impacted by the significance of each logic style. These circuits are designed by aiming few factors such as reduction of power dissipation, propagation delay and to provide area optimization. Most of the battery powered applications deal with these methods to prolong the life of the battery. Such applications can be designed by using CMOS logic styles which dissipates less power. CMOS design has equal number of n-type and p-type MOSFETs. CMOS logic exhibits high input impedance. It is used to design universal gates such as NAND and NOR. To obtain the output of basic gates an additional inverter is required.

This drawback can be overcomed by using TGL. A TGL gate is designed by parallely connecting the source and drain terminals of a pair of n-type and p-type MOSFETs. TGLs are bidirectional so the inputs can be applied to either of the short circuited terminals. The AND/OR logic are realized easily and effectively by using double pass transistor compared to CMOS logic. Adapting transmission gate logic which improves full swing output and noise margin. The drawback in TGL is that it does not provide faster restoration in output for specific inputs. Third alternative logic is PDVL, it provides full swing and faster restoration charge at output. The switching speed is also improved because it consists a single path for charging and separate path for discharging. PDVL requires less number of MOS devices compared to other logic styles. Fourth alternative method is mixed circuit logic where it combines the advantages of the other three logic styles, reduces the power dissipation, propagation delay and area.

For comparison of these logic styles, the abstraction level that is transistor level is best suited so a 2-4 decoder is designed in this level.

II. CMOS LOGIC STYLE

A 2-4 line decoder has 2 inputs and 4 outputs. In order to design an AHO decoder we need to design a NOR gate where the AHO decoder produces the output high and the others are low. These type of decoders are used in the construction of multiplexers. In order to design an ALO decoder we need to design a NAND gate where it produces the low output and the others are high. A CMOS logic produces the inverted output so we can design universal gates such as NAND and NOR gates. An AHO decoder is considered. A CMOS circuit consists of PMOS as the pull up network and NMOS as the pull down network. CMOS logic style provides high input impedance because the input is given to the gate terminals of the MOSFETs.

MOSFETs acts as a switch in all logic types. If logic '1' is given as an input to the nMOS then it acts as a closed switch and it is considered as ON whereas for the same given input the pMOS acts as the open switch and its status is OFF. If logic '0' is given as an input to the pMOS then it acts as a closed switch and the status is considered as ON whereas for the same input the nMOS acts as an open switch and the status is considered as OFF. A decoder is designed with inputs A, B and outputs Y0, Y1, Y2 and Y3.

Advantages of CMOS logic style are low static power dissipation and it is sustainable for changes in supply voltages. This logic style is independent of transistor sizing and it has high noise margin. CMOS logic is a ratio less logic, but the aspect ratio between the p-MOS and n-MOS must be maintained. Even though the supply voltage is reduced the CMOS design produces the allowable output levels. The layout design of the CMOS designs is simple and compact. More compactness is attained at the time of fabrication, during fabrication the p-MOS is placed in the n-well where the p-MOS and n-MOS devices are separated by a demarcation line. Device count is high in CMOS logic compared to the other

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BRAIN TUMOR DETECTION BASED ON K-MEANS CLUSTERING USING GUI

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ABSTRACT- The main objective of this project is to detect the tumefaction using graphical user interface in MATLABsoftware. Neoplasmisanunmanageablegrowthofclump in brain tissues. The identification of tumefaction can be done by using either CT (computerized tomography) scan or MRI (magnetic resonance imaging). Mostly theMRI images are preferred over CT scan as they describe functional information of the tumefaction.Theapproachtodesignthispaper involves four stages: - Pre-processing, edge detection,fuzzyc-meansclustering,followedby segmentation. This integrated approach allows the segmentation of swelling tissues with accuracy and reproducibility compared to manual segmentation. Finally, the tumefaction affected region is clearly displayed using segmentation.

Keywords- Tumefaction; Neoplasm; Fuzzy c- means; Threshold segmentation.

I. INTRODUCTION

Neoplasm is the foremost reason of death in economically developed countries. Tumefaction recognized medically as a malignant neoplasm, is an extensive group of a mixture of diseases, all concerning unregulated cell growth. In cancer, cells break up and breed widely, forming malignant tumors, and raid nearby parts of the body. The cancer may also expand to moredistant parts of the body through the lymphatic system or bloodstream. Not all tumors are cancerous. Benigntumorsdonotproduceuncontrollably,do not attack neighboring tissues, and do not spread throughout the body. The major symptoms of having it are a headache, vomiting, personality or behavioral changes, abnormalities of eyesetc.

Theremainingpaperisarrangedaccordingtothe currently used techniques for the proposed methodology in section II, and in section IIItheresults are analyzed. Lastly, section IV describes about the conclusion and future scope.

II. PROPOSED DESIGN

The proposed methodology employed here comprises of four stages. Images obtained or used should be of MRI scans and these scanned images are displayed in 2-D matrices which will have the numberofpixelsasitselements.Imagesarestored in MATLAB and converted (if not already) to be displayed as a gray scale image of size 256x256. The size is important to reduce processing time or to be large enough to be considered for proper processing. The values of gray scale image would range from 0 to 255, where '0' represents total black and '255' shows pure whitecolour.

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MULTI-BAND H-SHAPED FRACTAL ANTENNA FOR 5G WIRELESS APPLICATIONS

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Abstract- **In this paper, An H-Shaped-fractal antenna is proposed and operated at high frequency to meet the wireless applications. Self-similar fractal geometry applied to multi-band H-shaped patch radiator to minimize the antenna size at each iteration level. The design of the proposed antenna is done on low-cost substrate as FR-4 Epoxy having relative permittivity (ϵ_r) of 4.4, thickness (h) of 1.6mm and feed by using a line feed at patch edge. The designed antenna parameters are validated by using simulation software as Ansoft High-Frequency Structure Simulator of version 11. The performance parameters like VSWR, returnloss and gain are observed.**

Keywords- **H-shaped patch antenna, Fractal antenna, Modified Sierpinski Carpet.**

1. INTRODUCTION

Communication plays a major role in the society. Wireless communication systems have undergone rapid evolution than the wired communication systems. Multiband antennas are the small antennas of having compact in size capable to resonate at multiple frequency bands by designing a radiating patch in different shape such as H-shaped antenna are in high demand [1]. There are many types of antennas like Dipole antenna, Yadi Uda antenna, Helical antenna, Microstrip antenna, etc. Since the proposed antenna is for wireless applications. The most commonly used antenna for wireless applications is Microstrip antenna due to their bulky in size, lightweight, easy to fabricate, low profile, less volume, less complexity to design and inexpensive to fabricate [2], [3].

The Microstrip Patch Antenna (MPA) consists of thin metallically strip which is a conducting patch placed on ground plane having dielectric material in between them and excited by using the transmission line feed at the conducting patch edge. Due to the fringing fields, MPA radiates between edge of the patch and the ground [4]. There are different types of transmission lines feeding methods. But, in this proposed antenna line feed is used since it is easier methods to fabricate. However, conventional MPA have disadvantages like low gain, low power handling capability, inherently lower impedance bandwidth [5]. To across these limitations, fractal geometry technique implemented to the Microstrip Patch Antenna (MPA). By using the fractal geometry technique higher gain, wider bandwidth, multiple band frequencies ranges can be achieved [6].

The fractal concept was first discovered by Benoit Mandelbrot in 1975. Fractal geometry has the two main properties they are self similar and space filling. Self similar property makes antenna to have identical in shape but repeated with reduction in length. Space filling property makes minimization of antenna element and allows resonating at mutli-band frequencies [7], [15]. Different types of the fractal geometries shapes are Koch

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Design and Performance Analysis of 2x2 and 4x1 array antennas for Wireless Applications

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***Abstract*— This paper mainly focuses on designing an array antenna for wireless applications namely satellite applications, Radar applications within the frequency range of 5G. Our objective is to design a 2x2 and 4x1 array which operates at different frequencies. For designing, FR4 epoxy substrate with 1.6mm thickness is employed and antennas are fed by microstrip line. The Various antenna parameters namely S11, VSWR, Gain are calculated and compared for single patch, 2x1 array antenna, 2x2 array antenna and 4x1 array antenna. The designs are simulated using ANSOFT-HFSS.**

***Keywords*: 5G, array antenna, microstrip line, Gain.**

I. INTRODUCTION

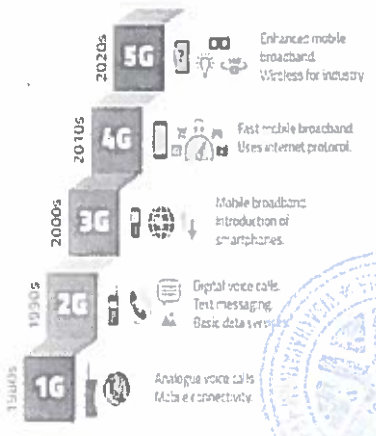
In recent times, the significance of wireless communication has been improved which results in miniaturization of electronic circuits. In past times, the wireless communication has experienced various generations from 1G to 4G technology[1]. Voice communication took place by using analog signals in first-generation system.. Later, from 2G digital techniques are evolved and implemented which resulted in the transmission of digital information. 5G provides a good range of advantages over the present 4G technology. Some of the advantages of 5G technology include a lower latency, increase in data throughput [3] etc. It also provides huge coverage area. This leads to the automation in various sectors like production, health care.

In telecommunications, to fabricate a microstrip antenna Printed Circuit Board(PCB) is used. Microstrip antennas are usually operated at microwave frequencies. Microstrip antennas are used for wireless applications because it offers a lot of benefits. Microstrip patch antennas are compact in size, lightweight. It provides high gain but provides narrow bandwidth which is a limitation. This limitation can be overcome by keeping multiple slots in antennas[5]. In pursuance of improving the bandwidth, the dielectric constant of the substrate should be minimized as mentioned in [6]. The antenna parameters are to be taken into consideration while estimating antenna performance. Return loss(S_{11}), VSWR, Gain are some of the parameters of an antenna which are considered in our work.

An array antenna is nothing but a combination or a group of antennas which work as a single antenna to transmit and receive radio waves. As the number of antennas increases in an array, the performance of array antenna increases. An array antenna can be used to improve overall gain, provide diversity reception, eliminate interference from a particular direction.

This paper primarily intensifies on enhancing the rectangular patch array antenna gain. It deals with the way to enhance the gain of 2x2 and 4x1 rectangular patch array antenna that operates at different 5G frequencies.

At the outset, we describe how the single rectangular patch antenna is designed and operated at 24GHz. The design of single rectangular patch antenna is simulated and results are observed. Later, we describe the designs of 2x1, 2x2 and 4x1 array antennas which are fed by inset feed[2]. Finally, the simulation results of a single patch, 2x1, 2x2, 4x1 array antenna are compared. The development in technology and enhancement in features from 1G to 5G can be seen in Fig. (a).



Recognition of Power Quality Disturbances utilizing Wavelet Transform

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ABSTRACT

This paper includes the power quality unsettling influences from recorded voltage waveforms utilizing wavelet change. The discrete wavelet change has been utilized to identify and investigate power quality unsettling influences. The unsettling influences of intrigue incorporate list, swell, blackout and transient. A force framework arrange has been recreated by Electromagnetic Transients Program. Voltage waveforms at key focuses have been gotten for investigation, which incorporates diverse force quality aggravations. At that point wavelet has been decided to perform include extraction. The yields of the component extraction are the wavelet coefficients speaking to the force quality unsettling influence signal. Wavelet coefficients at various level uncover the time confining data about the variety of the sign.

Keywords: Power quality, recognition of aggravation, wavelet change, multiresolution, signal disintegration.

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A BIDIRECTIONAL RESONANT DC-DC CONVERTER FOR APPLICATION OF ELECTRICAL VEHICLE CHARGING/ DISCHARGING SYSTEM

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I ABSTRACT

This is a DC to DC bidirectional resonant converter to be used for bidirectional power transfer applications especially battery charging/discharging applications in electrical vehicles. It is similar to an LLC resonant converter but for bidirectional functionality, an additional inductor and capacitor have been added in the secondary side of the circuit to make the resonant network symmetric for operation in both forward and backward directions. Zero Voltage Switching (ZVS) of the switches in the inverting stage is ensured. Also, the rectifier diodes in the secondary side turn off under ZCS. ZVS and ZCS result in reduction of losses and allow high frequency operation which leads to a reduction in the size of magnetic elements and filter capacitors thus reducing size, weight, volume and increasing power density. In this paper, first an equivalent model of the converter is developed for a detailed analysis of the converter voltages and currents. Then simulations of the converter are carried out to verify the validity of the conceptual design.

II INTRODUCTION

Before the development of power semiconductors and allied technologies, one way to convert the voltage of a DC supply to a higher voltage, for low-power applications, was to convert it to AC by using a vibrator, followed by a step-up transformer and rectifier. For higher power an electric motor was used to drive a generator of the desired voltage (sometimes combined into a single "dynamotor" unit, a motor and generator combined into one unit, with one winding driving the motor and the other generating the output voltage). These were relatively inefficient and expensive procedures used only when there was no alternative, as to power a car radio (which then used thermionic valves/tubes requiring much higher voltages than available from a 6 or 12 V car battery). The introduction of power semiconductors and integrated circuits made it economically viable to use techniques as described below. For example, to convert the DC power supply to high- frequency AC, use a transformer — small, light, and cheap due to the high frequency — to change the voltage, and rectify back to DC. Although by 1976 transistor car radio receivers did not require high voltages, some amateur radio operators continued to use vibrator supplies and dynamotors for mobile transceivers requiring high voltages although transistorized power supplies were available.

While it was possible to derive a lower voltage from a higher with a linear electronic circuit or even a resistor, these methods dissipated the excess as heat; energy-efficient conversion only became possible with solid-state switch-mode circuits.

DC to DC converters are used in portable electronic devices such as cellular phonesand laptop computers, which are supplied with power from batteries primarily. Such electronic devices often contain several sub-circuits, each with its own voltage level requirement different from that supplied by the battery or an external supply (sometimes higher or lower than the supply voltage). Additionally, the battery voltage declines as its stored energy is drained. Switched DC to DC converters offer a method to increase voltage from a partially lowered battery voltage thereby saving space instead of using multiple batteries to accomplish the same thing.

Most DC to DC converter circuits also regulate the output voltage. Some exceptions include high-efficiency LED power sources, which are a kind of DC to DC converter that regulates the current through the LEDs, and simple charge pumps which double or triple the output voltage. DC to DC converters which are developed to maximize the energy harvest for photovoltaic systems and for wind turbines are called power optimizers.

Transformers used for voltage conversion at mains frequencies of 50–60 Hz must be large and heavy for powers exceeding a few watts. This makes them expensive, and they are subject to energy losses in their windings and due to eddy currents in their cores. DC-to-DC techniques that use transformers or inductors work at much higher frequencies, requiring only much smaller, lighter, and cheaper wound components. Consequently these techniques are used even where a mains transformer could be used; for example, for domestic electronic appliances it is preferable to rectify mains voltage to DC, use switch- mode techniques to convert it to high-frequency AC at the desired voltage, then, usually, rectify to DC. The entire complex circuit is cheaper and more efficient than a simple mains transformer circuit of the same output. DC-DC converter is widely used in the DC micro grid applications for different voltage level applications.

2.1 LITERATURE SURVEY:

Bidirectional DC/DC converters possessing improved efficiency and high power density have been the focus of research in the area

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Predictive Torque Control of Three-Phase Induction Motor Drive with Inverter Switch Fault-Tolerance Capabilities

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***Abstract*— This paper presents a Predictive Torque Control (PTC) for three phase induction motor drive with inverter switch fault-tolerance to obtain the performance of a drive in post-fault operation as that of normal operation. This proposed topology operates the drive in rated capacity and also eliminates the DC-Link voltage balance issue in post-fault operation. The front end of 2-Level voltage source inverter for enhancement of DC voltage to meet the requirement of inverter during healthy and reconfiguration a conventional boost converter is used. The boost converter is controlled by current control technique and modified PTC to induction motor. The proposed converter retains all the advantages of the conventional converter by using less number of passive components and suitable for low and medium power applications. The results are presented based on simulation and experimental to compare with fault-tolerant converter topologies available in the literature to highlight the merits of the proposed topology. Further, operation of the drive is observed in field weakening region and results are found to be satisfactory.**

***Index Terms*—DC-DC Converter, Fault-Tolerant, Induction Motor Drive, Predictive Torque Control (PTC).**

I. Introduction

Induction motor drives are found in various industrial applications for better performance in terms of steady-state operation and fast dynamic response. However, the switches in the power electronic converter may prone to failure and cause huge loss in the production and expensive damages. This has spurred extensive research in the development of fault-tolerant converter topologies for improving the reliability of the induction motor drive. In literature, the fault diagnostic methods are discussed in [1]–[6], appropriate inverter reconfigurations are presented in [7]–[18] and post-fault control techniques required for better drive performance is explained in [7]–[22]. Delta connected induction motor with 2-level fault-tolerant converter, multi-level fault-tolerant converters and multi-phase drives are reported in [23]–[31]. In market place still dominant drives are 3-phase wye–connected induction motors with two-level inverters. Hence, the focus of this paper is to investigate a fault-tolerant converter for a three-phase induction motor drive. It is observed from the literature that, for a fault in the two-level inverter leg, fault-tolerant operation can be achieved by connecting the motor terminal of the faulty inverter leg connected either to the mid-point of DC-Link [7]–[12] or to an additional leg (auxiliary leg) [10]–[12] to maintain the three-phase operation of the motor. In case faulty phase of the inverter leg is detached and joined to mid-point of DC-Link, the faulty phase voltage of the motor is decreased to $\sqrt{3}$ times of its healthy phase voltage of the motor, speed of the motor is reduced to less than 50% of base speed, and DC-Link midpoint voltage fluctuates, which demand for a large DC-Link capacitor. Another way is, faulty inverter leg is detached and alternate path is provided for the motor neutral current to flow, either via DC-Link midpoint[7], [10]–[17] or an auxiliary inverter leg [10]–[12], [18]. The drawbacks for this topology is motor currents increase by $\sqrt{3}$ times and also the drive operates in two-phase mode. From the topologies available in literature, it is witnessed that the performance of the induction motor drive is de-rated to 50% of its rated capacity and also suffers from DC-Link voltage balance which creates fluctuations in the speed and ripples in the torque.

To conquer the above issues, a boost converter at front end of the 2-level inverter with modifications in PTC based induction motor with inverter switch fault-tolerance capability is proposed for both open-circuit and short-circuit switch fault in any leg of the inverter. The boost converter is controlled by current control algorithm which is used at the front-end of the 2-level converter to boost the voltage across DC-Link. In this topology, whenever a fault occurs in any leg of the inverter i.e. either open-circuit or short-circuit, the entire leg is isolated and the faulty phase of the motor terminal is connected to the additional capacitor in the proposed topology. As a result, the DC-Link voltage balancing issue in the conventional fault-tolerant topology is eliminated. To show the merits of the proposed converter, simulation and experimental results are presented and a detailed comparison is given with the topologies related to the fault-tolerant reported in the literature.

II. Proposed Fault-Tolerant Converter

The proposed fault-tolerant converter topology consists of a two-level inverter with a dc-dc boost converter at its front is used to control the induction motor. A single capacitor (C_1) at DC-Link of the inverter and an auxiliary capacitor (C_2) with switch T_{ABC} is used for fault-tolerant operation as shown in Fig.1. Whenever an open-circuit or short-circuit fault occurs in any switch of the inverter leg, that leg is detached and the motor corresponding terminal is connected to the auxiliary capacitor (C_2) and switch T_{ABC} is turned-on. The motor currents, speed and capacitor voltages V_{C1} and V_{C2} are sensed and given to the dSpace 1104 controller board to implement the control algorithm for boost converter as well as predictive torque

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DEPLOYMENT OF FEATURE SCRIPT IN COLLABORATION WITH CLOUD COMPUTING

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ABSTRACT

Present design, manufacturing and testing scenario is fully dominated by computer network. The situation demands transfer of model data from one design to another in heterogeneous environment. The present work deals with a new platform for creating CAD models from simple 2D surface to complex 3D models like gears, bolts, nuts etc. by using FeatureScript in collaboration with cloud computing. Feature Script is a new scripting language used for generating, modelling all CAD packages and can accomplish collaborating the different technologies and helps to end user of any organization or enterprise by cloud computing. An internet based model provides platform to an easy access of resources to end user for storing, running the CAD operations and further execution of such program in order to obtain specified design. Essential features of cloud computing are discussed with regard to the end users, enterprises that use cloud as a platform. In present work feature script are developed for standard primitives such as cylinder, cube, sphere, arc, chamfer and fillet.

KEYWORDS: Computer, remote servers, cloud, model, cost, infrastructure, collaboration, Feature Script, CAD modeling, Onshape

Original Article

1. INTRODUCTION

1.1 Cloud computing

It is an enhanced internet based model which provides on demand access of remote computer networks, servers, digilockers, processing of data, its application to private or third party user in any part of the globe [1- 3]. Cloud computing reduces infrastructure cost and helps to gear up to improved technology for the drastic changes in business [4-6].

1.2 Collaboration

Collaboration Engineering is a method to design and implement collaboration processes that can be executed by users for high quality repeating tasks [7-8]. An evaluation results in collaboration processes with lower investment in training to adopt and sustain collaboration [9].A step by step procedure for the design of such collaboration process. Many researchers evaluated this approach for testing its benefits [10-11].

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Original Article

DESIGN AND ANALYSIS OF JET PROPULSION TURBINE

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ABSTRACT

The 94- inch- fan PW 4000 is the first model in Pratt and Whitney's high thrust family for large aircraft. The turbo fan in the jet engine bypasses a huge amount of air. The majority of the thrust force comes from the fan reaction force. The turbine will rotate due to the flow of hot combustion gases and these gases expand during this process. Turbine is designed for a mass flow rate of 20 kg/s as per the 94- inch- fan PW 4000 engine specifications. Modeling of the turbine is done in CATIAV5. The turbine is meshed with three dimensional tetrahedral elements and with improved sizing. CFD analysis is done in order to evaluate the pressure, temperature and velocity distributions at the outlet of the first stage of high pressure turbine system for the new mass flow rate conditions. The inlet temperature, pressure and velocity distributions are obtained from the previous analysis and theoretical calculations.

KEYWORDS: Design, Geometrical Modelling

1. INTRODUCTION

Jet engines have type of gas turbines that are used to generate a high-speed jet for propulsive purposes. It's driven and discharges a high-speed moving jet of fluid to generate thrust in accordance with Newton's third law of motion. Examples of gas turbines being used for aircraft propulsion applications include turboprops, turbojets, turbofans, and ramjets. In general a gas turbine consists of an upstream compressor coupled to a downstream turbine, and a burner in between [1]. These components are from the part of a gas turbine, e.g. gas generator. Turbofan engines are found on commercial airlines around the world and have revolutionized the way we travel. The turbofan engine functions by the way of a thermodynamic cycle where air is ingested into the engine, compressed, combusted, expanded, and exhausted from the engine creating thrust to propel the vehicle. These five steps are carried out by five major engine components: the fan, compressor (low and high pressure), combustor (or combustion chamber), turbine (high and low pressure), and exhaust nozzle. They were designed as a compromise between the turboprop and turbojet engines [2]. A turbo engine induces a large internal propeller and two streams of air flowing through the engine.

The Pratt and Whitney PW 4000 is a family of high-bypass turbofan aircraft engines with certified thrust ranging from 230 to 441 KN. Built as the successor to the JT9D series engines, it has found much wider application than its predecessor. The PW4000 is divided into 3 distinct families based on fan diameter. The first family is the 94 inch diameter fan with certified thrust ranging from 230 to 275 KN. It's certified for 180 minutes ETOPS if used

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Design and Analysis of Ducted Fan Micro Aerial Vehicle

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ABSTRACT: A micro aerial vehicle (MAV) is a class of unmanned aerial vehicles (UAV) that has a constraint in size and self-governing automatic control unit. Micro Air Vehicles (MAVs) conveniently operate with compact sized and low weight components, thus enable to operate against high wind velocity and capture high quality image data. For a new design of MAV system require to integrate multiple controlled components, accomplishing the overall performance of MAV mission. In this project a new design of ducted fan MAV was modeled with a size limited below 20cm. The vertical take-off and landing (VTOL) type was configured with fixed wing of newly design compact MAV to overcome the issues of low Reynolds number aerodynamics issue. The aerodynamics performance such as coefficient of lift (CL) and coefficient of drag (CD)was determined and validated with existing model of VTOL type UAV. The conceptual model of ducted fan micro aerial vehicle (DMAV) was designed in CAD software and aerodynamic analysis such as CL and CD was analyzed using CFD- fluent software. The dynamic pressure over the DMAV was determined and found that the value is within the limit and also the flow visualization for full-scale model of ducted fan MAV was stimulated for various angle of attack such as 5°, 10°, 15° and predicted the CL and CD for the performance characteristics of the newly designed model DMAV.

KEYWORDS: DMAV, UAV, coefficient of lift, coefficient of drag, angle of attack and CFD.

I. INTRODUCTION

An unmanned aerial vehicle (UAV), known in the mainstream as a drone and also referred to as an unpiloted aerial vehicle and a remotely piloted aircraft (RPA) by the International Civil Aviation Organization (ICAO), is an aircraft without a human pilot aboard. Unmanned air vehicles with a largest linear dimension no greater than 6 inches. Micro air vehicle is a class of UAV. Micro air vehicles (MAVs) are intended to operate in close proximity to a point of interest without being detected and should provide surveillance teams with critical information. Small vehicle size is intended to lower the total system cost when compared to larger military UAVs and will also allow these aircraft to be man portable. A typical MAV mission consists of flying 1km to a point of interest, loitering in close proximity for 1/2 hour, and then returning. The aircraft must be able to fly in turbulent winds up to 25 mph, perform tight turns near buildings, and climb repeatedly to 350 feet altitude. Currently, there are no MAV designs which meet these criteria and many technical issues must be resolved before a successful MAV can be produced. This project addresses the issues of how propulsion and configuration influence the mission capability of MAV's. A numerical optimization procedure is used to find the smallest aircraft that meets the mission performance constraints given the assumed propulsion, aerodynamic, structural, and payload models. Our study concludes with several observations on the influence of vehicle size on mission capability. Our experience has shown that with present technologies the maximum capability of an MAV system is realized with aircraft in the 50 to 100 cm

II. RELATED WORK

Daisuke Kubo and Shinji Suzuki (2008) [1] "Tail-Sitter Vertical Takeoff and Landing Unmanned Aerial Vehicle Transitional Flight Analysis", Journal says about the vertical takeoff and landing features and advantages during the flight path. Zamri Omar [2] have investigated Vertically Takeoff and Landing (VTOL) type Unmanned Aerial Vehicle (UAV) control system and its working, also it explains about the designing of the ducted fan type UAV and its important nomenclature regarding the aerodynamic properties and components selection for UAV. Mohd. Shariff Ammoo and Md. Nizam Dahalan [3] have studied about technological review and design study of Micro Aerial

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Study of the Effect of Silicon Oxide Nanoparticles in the Copper Alloy

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ABSTRACT

The main objective of this paper is to study the effect of the Silicon oxide nanoparticles in the copper alloy which is manufactured by using the stir casting process and samples are prepared as per the ASTM standards. These specimens are tested under the mechanical tests. Due to blending of the nanoparticles the properties of copper alloy will be enhanced. so uniform ASTM samples with varying composition of nano particles are manufactured and compared with the copper alloy without reinforced particles. Its main application is found in journal bearings, rotary rock bits in oil and gas industry and they can also bear mechanical and thermal shocks. The scratch and wear properties are enhanced by adding silicon oxide nanoparticles so these properties are tested by conducting wear test and scratch test for scratch hardness.

Keywords: *SiO_2nano powder, Wear test, scratch test, Ball milling, stir casting, Linear elastic module.*

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INTRODUCTION

Copper alloys have wide application in naval, marine, oil and gas industries. Naval brass is one of such copper alloy having chemical composition as shown in Table 1. Cu alloy is mixture of Cr, C, W, Fe and Ni and they are used for high temperature wear resistance, corrosion resistance. Copper alloy is manufactured by stir-casting process. The mechanical properties of copper alloycan be altered by adding silicon oxide nano particles. To test the effect of these silicon oxide nanoparticles, copper alloy with various compositions of nanoparticles are made. Scratch and wear tests can be performed to observe the improved properties.

Table 1: Specimen composition:

Element	Chromium	Tungsten	Carbon	Iron	Nickel	SiO_2	Copper
content	5	11-13	0.5	1	1	1,1.5,2,2.5,3	remaining

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Investigation of Mechanical Properties of Chopped Strand E-glass Fiber and Basalt Fiber Reinforcement with Epoxy Resin with and without Addition of Crab Shell Powder

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ABSTRACT: Lightweight eco-friendly composites with enhanced mechanical properties combined with cost-effectiveness are widely used in recent industrial applications. Basalt and E-glass composites are such combinations used extensively but they are not eco-friendly and cost-effective. In this work, to improve the degradability and cost-effectiveness, a new hybrid composite is prepared by using basalt fiber, chopped strand E-glass and crab shell powder as filler material. The crab shell is a natural material made up of highly mineralized chitin–protein fibers structured in a twisted pattern of plywood. However, there is no significant research on the use of crab shell powder as a filler material. The present work is an assessment of the mechanical behavior of composites made up of E-glass chopped strand fiber and basalt fiber as reinforcement with epoxy as a matrix with and without crab shell powder as filler. Flexural, compression, impact, and tensile strengths along with the hardness of composites are tested by varying the weight percentage of filler material. Specimens are prepared using 2.6%, 5.2%, and 7.6% by weight of crab shell powder through the hand lay-up technique with a curing time of 24 hours. A trend of increment of mechanical properties can be observed with an increase in the percentage composition of crab - shell powder. The hybrid composite with 7.6% by weight of crab shell powder as filler material has obtained high properties such as tensile strength of 164.63 MPa, the compression strength of 17.66 MPa, a flexural strength of 281.511 MPa, the hardness of 58.039 Kg/sq. mmand toughness of 13.85J/sq. mm. The experimental study shows that the mechanical properties are enhanced and the material cost is also reduced with an increase in the weight percentage of crab shell powder as a filler material.

Keywords: Crab shell powder, Epoxy, Chopped Strand E-glass Fiber (CSEF), Basalt fiber, Hand lay-up method, Filler material.

Abbreviations: Chopped Strand E-glass Fiber (CSEF), Basalt fiber (B).

I. INTRODUCTION

Modern technological advances require materials with high strength to weight ratio, high fatigue strength, dimensional stability, high stiffness, corrosion resistance, and affordability, which can't be met through conventional materials. Therefore, intensive studies are being executed regarding the improvement of composites fabricated out of unconventional and naturally occurring material.

To improve the flexural strength and cost-effectiveness, some carbon layers are replaced by basalt and glass fibers by sandwiching them between extreme layers of carbon in carbon fiber reinforced polymer (CFRP) composites [1]. The mechanical properties of hybrid bio-composite, prepared by mixing the walnut shell powder and coconut fiber in epoxy resin are studied and the results are compared with that of pure epoxy resin [2]. Basalt composites also exhibit better hoop tensile strength and superior properties of interlaminar shear stress when compared to other extensively used glass fibers [3].

Flexural and tensile properties are intermediate and the impact properties are higher in basalt-glass polyester than those of plain basalt and plain glass [4]. Polyester composites reinforced with chopped strand mat glass fiber have higher mechanical properties than woven glass reinforced fibers [5].

Basalt has better mechanical properties along with high corrosion resistance and low thermal conductivity when compared to asbestos and conventional glass fibers put together [6].Three-layered vacuum-bagged epoxy composite with chopped strands and plain woven e-glass mat have better flexural, tensile and interlaminar shear strength but lower impact strength than the laminates with one layer of plain-woven mat and two layers of chopped strand mat [7]. A detailed review has been conducted on the behavior of basalt fiber to understand its fiber structure and other significant material properties. The interaction of basalt as reinforcement with different matrix materials is also studied [8].

The effect of basalt fiber hybridization on the effective low impact velocity behavior of glass/basalt woven material/epoxy resin composites is studied and the maximum favorable flexural properties are significant in laminates of symmetric sandwich-like configuration [9]. Under abrasive wear conditions, chopped glass fiber