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2-(6-Methyl-1-benzofuran-3-yl)acetic acid

N. Ramprasad,^a K. V. Arjuna Gowda,^{b*} Ramakrishna Gowda,^c Mahantesha Basanagouda,^d K. S. Kantharaj^e and G. V. Jagadeesha Gowda^f

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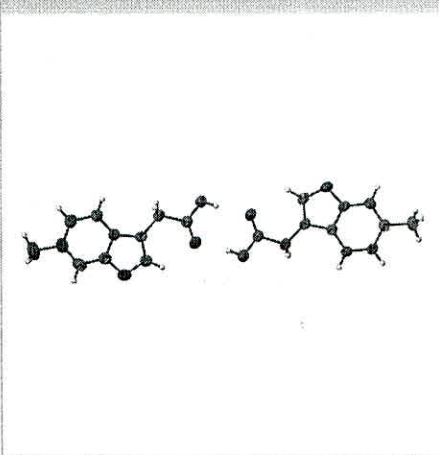
Keywords: crystal structure; benzofuran; hydrogen bonding; C—H... π interactions.

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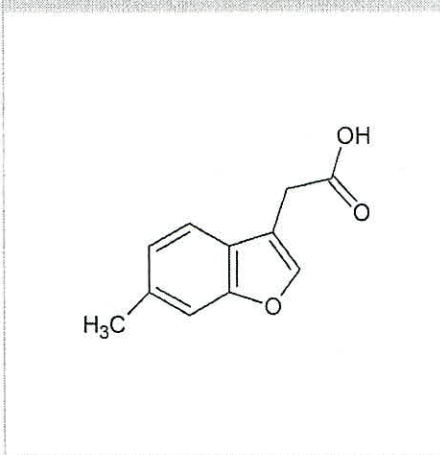
Structural data: full structural data are available from iucrdata.iucr.org

The asymmetric unit of the title compound, C₁₁H₁₀O₃, contains two crystallographically independent molecules (*A* and *B*) with nearly matching conformations. Both molecules are almost planar [r.m.s. overlay fit for the non-hydrogen atoms = 0.011 (1) Å] and in each molecule there is a short intramolecular C—H...O contact. In both molecules, the OH group of the acetic acid residue occupies a position approximately antiperiplanar to the C atom of the heterocycle. In the crystal, the two molecules are linked by a pair of O—H...O hydrogen bonds, enclosing an *R*₂²(8) ring motif and forming an *A*—*B* dimer. The dimers are linked by C—H... π interactions, forming columns along the [010] direction.

3D view



Chemical scheme



Structure description

Benzofuran derivatives have occupied an important place among various heterocycles by virtue of their involvement in medicinal chemistry and drug discovery (Hiremathad *et al.*, 2015). Carboxylic acids such as arylalkanoic acids exhibit interesting anti-inflammatory, analgesic and antipyretic properties, and so have been in wide clinical use for a number of years (Basanagouda *et al.* 2015).

The asymmetric unit of the title compound contains two crystallographically independent molecules (*A* = C1—C11/O1—O3 and *B* = C12—C22/O4—O6), which are almost identical (Fig. 1). Both molecules are almost planar with an r.m.s. overlay fit for the non-hydrogen atoms of 0.011 (1) Å. In each molecule there is a short intramolecular C—H...O contact present (Table 1). The bond lengths and angles of the title molecules are close to those observed for similar structures, viz. 2-(5-methoxy-1-benzofuran-3-yl)acetic

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DNA Barcoding

Gowthami S., Saranya D., Prashanth Kumar H.P., Rohit K. C.

Abstract

Abstract

DNA barcoding system is a promising approach towards the diagnosis of biological diversity using DNA sequences as a primary key for retrieval of genetic information. It is emerging as a standardised method for mapping various species on the earth. DNA barcoding is a tool for identification of new species, conservation of endangered species and clustering of various species under a particular group. Many databases have been developed across the globe for the quick assessment of various DNA barcodes. Consortium for the Barcode of Life (CBOL) and Barcode of Life Database (BOLD) serves as the major barcode sources for the researchers in species identification. There are few accepted barcodes across the globe for identification of the species such as CO1 gene for animals and rbcL, matK, trnH-psbA for plants and ITS gene for fungal species. Hence DNA barcoding is the new modernised, speedy, precise and consistent method for biodiversity identification. This review study shows salient features of DNA barcoding system as a simple modernised taxonomical tool for species identifications.

Keywords: DNA barcoding, CO1 gene, matK gene, trnH-psbA gene, biodiversity

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Physiological studies of *Helminthosporium* Pathovars Isolated from Infected Maize Plant in the Region of Karnataka

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²Department of Bioinformatics and Biotechnology, Kuvempu University, Shankerghatta

Abstract: Karnataka is one of the potential maize producing regions in India. Therefore maize in this region has the potential to become diseased under certain conditions. Diseases of crops can affect plant physiological activities, yield and/ or quality of the harvested commodity which can impact profitability and increase the risks of farming. Disease management is one of the major problems faced by farmers, and this has become a big threat and made farmers to become risk adverse to invest in farming as a business. This study is about to determine suitable culture conditions such as different culture media, optimum temperature, pH, carbon source were optimized to culture *Helminthosporium* in laboratory conditions to do characterize the gene for pathogenicity. Among all the media the best media were found to be the MRBA and PDA. It was found to be the optimum temperature and pH were 20° & 25° and pH of 5 & 6. Carbon source for the optimum growth was selected by growing in different carbon sources. It was revealed that best carbon source found to be starch for better growth of colonies. Along with these parameters, toxin study of the Pathogen was done. The crude phytotoxic was extracted from culture filtrate using methanol and chloroform. TLC revealed the presences of toxin in crude extract.

Keywords: *Helminthosporium* pathovars, pathogenicity, temperature, pH, carbon source

1. Introduction

Maize (*Zea mays*, L) is regarded as the queen of cereals due to its high yield efficiency. Maize is the third most important food grain in India next to wheat and rice. Despite its high yield potential, one of the major limiting factors of maize grain yield is its sensitivity to several biotic stresses especially the diseases. According to some record about 65 pathogens infects maize and of these maydis leaf blight or southern corn leaf blight is considered as one of the serious disease the extent and severity of MLB disease varies from season to season. In warm (20 – 32°C) and moderately humid environment of the world, maydis blight is potentially damaging and may cause significant yield losses (Thomson and bergquest 1984). Southern corn leaf blight (SCLB) is an important foliar disease of maize crop and caused by fungi

sheaths, ear husks, ears and cobs. Race C is a cms-C cytoplasm-specific race reported only in China (Wei et.al 1988). Karnataka is one of the potential maize producing regions in India. Therefore maize in this region has the potential to become diseased under certain conditions. Diseases of crops can affect plant physiological activities, yield and/ or quality of the harvested commodity which can impact profitability and increase the risks of farming. Disease management is one of the major problems faced by farmers, and this has become a big threat and made farmers to become risk adverse to invest in farming as a business. It is also one of the factors leading to yield reduction; southern corn leaf blight is one of the prone fungal diseases in maize. Therefore it is important to carry out a study on prevalence of southern corn leaf blight pathogen of maize in Karnataka.

2. Materials and Methods

Pathogen culture

The youngest fully expanded mature leaves from *zea mays* were harvested, washed and dried on the paper towel. Leaf disks of 20mm diameter were exercised carefully with needle from leaf samples. The leaf disks were placed immediately in Petri plates containing SDA/PDA media. Petri plates were placed in growth chamber maintained at 25°C for 2-3 days. Mixed cultures were obtained. *Helminthosporium* pathovars was grown on SDA media and cultured for about 48 hours the culture was grown which results in mixed culture. And it is screened for the presence of *Helminthosporium* pathovars it was sub cultured to obtain pure culture. The pure culture was isolated and identified by using microscope by lacto phenol staining method.

Effect of Different media for colony growth

The effect of culture conditions including media, incubation temperature, carbon source and pH were observed on growth of

Helminthosporium (*Cochliobolus heterostrophus*), and also known as (Anamorphs *Bipolaris maydis* or ascomycetes, *Helminthosporium maydis*) but for the sake of brevity we will refer to all of these as *Helminthosporium*. It is reported from most maize growing regions but most devastating in hot and humid tropical and temperate areas of the world. Almost 70% yield loss is recorded due to SCLB (Kump et.al 2011). No known genes confer complete immunity to this disease; instead, maize breeders rely on polygenic, quantitative resistance to SCLB (Holley and Goodman 1989). Three races of *C. heterostrophus* known as O, T and C have been identified to date (Smith et.al 1970). Race O is considered to be the most common race in most areas and is controlled by nuclear genes. Race T, the cause of the 1970s epidemic in North America, is specific to maize containing Texas male-sterile cytoplasm (cms-T) and is controlled mainly by cytoplasmic factors. The most prominent difference between race O and T is that race O only attacks leaves while race T attacks leaves, stalks, leaf

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A DETAILED STUDY ON RECLAIMED ASPHALT PAVEMENT IN PAVEMENT QUALITY CEMENT CONCRETE

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ABSTRACT

RAP (reclaimed asphalt pavement) produced from the reconstruction of asphalt road pavements is one of the alternative material proposed. Rap can be used as an alternative material for both fine and coarse aggregate, it is conventionally used as coarse aggregate in asphalt pavement. In this experimental study, Performance of Pavement Quality Cement Concrete(PQCC) is studied when virgin aggregates are replaced by RAP by conducting experimental study in laboratory and also performing numerical analysis on RAP concrete model cube by using ANSYS to find out stress value at different percentage of RAP and age of concrete under loading. Fine aggregate is replaced with RAP by 0%, 15%, 30%, 45%, 60% and Coarse aggregate with RAP by 0%, 15%, 30%, 45%, and 60%. Experimental results are validated with numerical results. It is observed that RAP will reduce the performance of concrete and affects mechanical properties of concrete like compressive and flexural strength, density on increasing the percentage in concrete. But for 15 % replacement, RAP concrete has fulfilled the requirements of M30 concrete and for 30% replacement, compressive strength of concrete is 28.45 N/mm^2 which is very near to the minimum strength value of M30 concrete. For all mix proportions of concrete flexural strength is more than minimum required strength of M30 concrete. The results indicated that RAP can be used as an aggregate in PQCC up to limited percentage.

Key words: RAP, ANSYS, PQCC, M30 concrete.

Cite this Article: Munagala Sreenivasulu Reddy and Suvarna P., A Detailed Study on Reclaimed Asphalt Pavement in Pavement Quality Cement Concrete. *International Journal of Civil Engineering and Technology*, 7(5), 2016, pp.382 –392.

<http://www.iaeme.com/IJCIET/issues.asp?JType=IJCIET&VType=7&IType=5>

1. INTRODUCTION

Recycling of asphalt pavements is one of the most effective and proved and also approved recycling processes. It has been organized and being used successfully for rehabilitation processes in many countries across the globe. The reuse of removed asphalt pavement in India has not given more importance in 20th century, because of the poor economic conditions and lack of updated, new technologies. The cost of

Seismic Analysis of RC Building with Underground Stories Considering Soil Structure Interaction

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Abstract:

Out of Several Countries in the world that is subjected to repeated natural calamities, India is also one of them. While mentioning the natural calamities, one of the calamities that leads to the loss of human life is the earthquake. Earthquake does not give any clue prior to its influence on human life and natural resources. In spite of the improved technologies it has become difficult to manage with the influence of earthquake. One of the best way to save the loss of human life is that to design the structure in such a way so that it is capable of resisting the earthquake forces to a maximum extent. Hence in present study, an attempt has been made to study the effect of soil structure interaction on an RC framed building with underground stories under seismic loading. Structure is analyzed using response spectrum method. Modeling and analysis is carried out using SAP2000. Results are considered for structure resting on three types of soil namely soft, medium and hard. Raft foundation type is adopted for all models.

Keywords: Soil Structure Interaction, Underground Stories, Raft foundation

I. INTRODUCTION

Seismic waves are generated due to the release of energy in the Earth's crust, which is in turn due to the disturbance caused on the earth's surface. It is well known fact that the building is resting on the soil and the building undergoes displacement during the earthquake. But usually buildings are modeled and analyzed without considering soil structure interaction. When earthquake waves reach the structure, it is subjected to motion. This motion produced due to the earthquake waves depends on vibration characteristics of structure and also on the plan of the structure. If the structure overwhelms its own Inertia force then it is possible for structure to respond to the motion. As a result of this, soil and structure interacts. It is known that at foundation level earthquake motions are observed and character of earthquake motion is based on the level of response of the structure. These factors mainly depend on stiffness and mass of both structure and the soil. From this it can be inferred that, the foundation property plays a major role in the structure's response during earthquake. But when considering the influence of earthquake on the building it is important to consider the interaction effects of the soil and the structure as both the structure and the soil show their influence on each other. In the present thesis underground stories is also considered, since it has become an important wing in the modern urban construction. Due to the reason that underground stories does not fluctuate during the earthquake, basement floors are being ignored throughout the seismic analysis of building which includes underground stories. Hence in the present study, it is shown how the seismic response of those structures that include underground stories is affected.

II OBJECTIVE OF STUDY

The main objective of the thesis is to find the seismic response of the building with underground stories which includes the soil structure interaction. For the sake of analysis and modelling, SAP2000 software is used. The structure is modeled with different types of soil.

III STUDY METHODOLOGY

Using the suitable soil conditions, and by giving the suitable input details of the building, building is modeled and analyzed. For the purpose of the analysis, response spectrum method is adopted. The software used for the study is the SAP2000. The different models considered are fixed base model, Winkler and FEM model. In FEM model, soil is assumed as linear elastic continuum, with its depth equal to 1.5 times the base of the building. Typical 3D model of all types are presented from fig 2, fig 3, fig 4.

Table I. Geometric and material properties

Component	Description	Data
Model details	Number of storeys	15
	Number of bays in X direction	2
	Number of bays in Y direction	2
	Storey Height	3m
	Bay width in X direction	10m
	Bay width in Y direction	10m
	Size of beam	0.3m*0.3m
	Size of column	0.45m*0.45m
	Thickness of slab	0.125m
Materials	Grade of steel	Fe-415
	Grade of concrete	M30
Seismic parameters	Seismic zone	II
	Importance factor	1
	Response reduction factor	3
Foundation Type	Raft Footing	Size:24m*24m Depth:1m

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Modification of block matches three dimension algorithms for de-noising spatial domain optical coherence tomography images.

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¹Department of Computer Science and Engineering, University of Mysore, India

²Department of Electronics & Communications, Mysore, India

Abstract

The analysis in a therapeutic picture assumes an imperative part highlighting on operations as picture rebuilding, include extraction and protest acknowledgment. These operations may end up plainly chaotic if the pictures are debased with clamors. So formulating a proficient calculation for clamor evacuation is a vital and testing research range in nowadays even with plenteous existing de-noising calculation. Creating Image de-noising calculations is a bulky assignment since vital subtle elements in a therapeutic picture inserting symptomatic data ought not be destroyed while expelling the commotion. This paper proposes an altered de-noising approach for retinal Optical Tomography Images by fusing un-annihilated Wavelet Transform to the current piece coordinating three measurement calculation, which that its uses in The outcomes demonstrates that the de-noised picture utilizing adjusted BM3D(Block Matching three measurement) have an enhanced PSNR and visual quality when contrasted with the condition of craftsmanship BM3D calculation which in turns will help the specialists to finding the malady better.

Keywords: De-noise, speckle noise, optical coherence tomography.

Accepted on June 20, 2017

Introduction

Optical intelligibility tomography (OCT) is a rising imaging methodology that has been broadly utilized as a part of the field of biomedical imaging. In the current past, it has discovered uses as a demonstrative apparatus in dermatology, cardiology, and ophthalmology. In this paper we concentrate on its applications in the field of ophthalmology and retinal imaging. OCT can non-obtrusively create cross-sectional volumetric pictures of the tissues which can be utilized for investigation of tissue structure and properties. Because of the hidden material science, OCT pictures experience the ill effects of a granular example, called dot commotion, which limits the procedure of translation. This requires particular clamor decrease strategies to dispense with the commotion while protecting picture points of interest.

Optical intelligibility tomography (OCT) is a capable imaging framework for procuring 3D volumetric pictures of tissues non-intrusively. In basic terms, OCT can be considered as echography with light [1,2]. Dissimilar to echography which is finished by sound waves, OCT imaging is not time-of-flight based but instead produces the picture in view of the impedance designs demonstrates a run of the mill retinal OCT picture with false shading. All through the previous two decades, new advancements in the OCT imaging framework have enhanced the procurement time and furthermore the nature of the obtained pictures. These days taking (μm -level) volume pictures of the tissues is extremely normal particularly in ophthalmology and retinal imaging. Because of the volume of information produced in a clinical setting, there is a requirement for hearty and mechanized investigation methods to completely use the abilities of OCT imaging [3].

In the previous decade thorough and comprehensive research has been done both in the fields of bio restorative imaging and remote detecting for smothering spot commotion. Copious methodologies have been contrived to upgrade the picture quality corrupted by dot commotion [4,5]. A few dot lessening methods are depicted by [6,7]. A wavelet based delicate thresholding procedure has been beforehand connected to OCT pictures adulterated by dot commotion [8]. It registers the undecimated wavelet change and applies delicate thresholding to the level, vertical and asks few sub groups. The edge is acquired utilizing the measurements of the wavelet coefficients. The wavelet based procedure portrayed in [8] does not lessen the picture sharpness altogether but rather the execution time for the calculation is around 7 min utilizing Matlab usage. Altered Lee and Kuan versatile channels have been connected to SAR spot lessening [9].

Anisotropic dispersion is one of eminent that has been before connected for spot commotion expulsion in OCT pictures. For instance, in references [6,7] the angle of the picture is utilized for the computation of the dissemination coefficient with no thought to the genuine clamor present. Bo Chong and Yong-Kai Zhu proposed a novel dot commotion decrease calculation in OCT. The calculation depends on piece coordinating 3D channel altered by morlet wavelet decomposition. Original OCT picture information changed by logarithmic pressure is deteriorated into 10 segments by morlet wavelet for three levels. Every part is proposed by a suited BM3D channel and the yield picture is recreated by wavelet turn around change [8]. Mashaly et al. exhibited a versatile numerical morphological channel is proposed to lessen the dot commotion in SAR pictures [9]. Optical Coherence Tomography Noise Reduction Using Anisotropic Local Bivariate Gaussian Mixture Prior

Principal

Modelling Selective Perception for Knowledge from Image Database

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Abstract: Designing a mathematical model for understanding the properties of the images components is a complex task which embodies in it the process of visualizing image for the discrimination features.

In present work since we are considering a medical image the components or stages like preprocessing will in itself be a tough job.

The process of cognition of images has to be done at a first step for the machine intelligence to create a scale for set of particular images, which in turn will be used to characterize or classify the test image which in a process involved in Recognition phase.

I. INTRODUCTION

Human vision seems to recognize fractured part in X-ray image with relative ease, when compared to machine recognition which is much more daunting task. In addition to cognitive aspects, understanding X-ray is important, since the same underlying mechanism could be used to build a system for the machine identification of fractured part in X-ray image [1]. The machine recognition of fractured X-ray image is emerging as an active research broader area spreading among several disciplines such as Image Processing, Pattern Recognition, Computer Vision and Neural Networks.

We feel, Computers can now out perform human in X-ray identification tasks, particularly those in which large database of X-ray images must be searched. A system with the ability to detect and recognize fractured part in X-ray has many potential applications in medicine. Specially to understand progression of calcification system. But one need to address several related issues such as:

- i. X-ray image must be clear noise free, so that we can detect or identify the fractured part.
- ii. Search the given X-ray image in data base.
- iii. Identification and verification of fractured part in an X-ray using appropriate algorithms.

Identifying fractured part in an X-ray image is a difficult task mostly because of the inherent variability of the image formation in terms of image quality, photometry, geometry, occlusion [2]. While solutions to the task of identifying fractured part in an X-ray image have been

presented, recognition performance of many systems are heavily dependent upon a strictly constraint environment. The problem of identifying fractured part in an X-ray image remains largely unsolved.

II. LITERATURE REVIEW

Pattern Recognition

The existence of an uncomfortable situation is very often experienced in almost all the domains man encounters, and it becomes imperative (essential) to apply necessary recovery or corrective operations on the system to reestablish the health of the system.

Cases of such disorders, requiring multi-disciplinary support are to be found in plenty in many fields and in particular, in the medical field. Although, in general, a medical expert is proficient in diagnosing or recognizing the fracture in an X-ray image, it could become difficult to assess and accurately quantify the depth of fracture, which is a very important stage in deciding the course of the treatment to be administered to a patient.

This entire research is due to the inspiration provided by the burgeoning discipline of Pattern Cognition and Recognition (DH-90;FK-99). Pattern Recognition and classification covers a wide spectrum of disciplines (DH-73;DHS-01). The field of Pattern Recognition has attained considerable importance. Pattern Recognition is considered a major field in the wider realm (domain) of Artificial Intelligence (Don-98).

Classification

Classification of an n-dimensional data set or cluster analysis is one of the Pattern Recognition techniques and should be appreciated as such (DH-73; JD-88; DHS-01). The Pattern Recognition field has developed several classification techniques (DK-73; JRD-00). The classification can be of two types: Unsupervised and Supervised (JD-88).

The Unsupervised type of classification is broadly referred to as Cluster analysis. It deals with the problem of finding natural partitions in the n-dimensional data space of m samples, where each partition represents a class of

An Efficient Digital Baseband Encoder for Short Range Wireless Communication Applications

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Abstract: Various physical layer protocols are employed to encode information bits in short range wireless communication technologies. In this paper, we propose a multimode hardware architecture for a digital baseband encoder which incorporates Manchester, Differential Manchester and FM0 codes. These codes help in achieving good DC balance thereby improving signal reliability. Alternating Manchester with Differential Manchester for different intervals of time improves security at the physical layer level. This work aims at efficient integration of hardware components for the three coding modes.

Keywords: Manchester; Differential Manchester; FM0; Short range wireless communication; VLSI.

I. INTRODUCTION

Short range wireless communication systems have become ubiquitous in our day to day life. To name a few, Wi-Fi Zigbee, Bluetooth, RFID, UWB etc. have worked wonders in several fields including security, medical care, vehicular communication and consumer applications. These technologies employ different physical layer protocols for encoding the information bits. Different standards support different encoding mechanisms. These include Manchester encoding, Differential Manchester encoding and FM0 encoding. These come under the category of bi-phase codes. They have a signal transition within a bit duration thus providing adequate timing information to the receiving end. They have good DC balance – equal number of 1's and 0's throughout a message frame irrespective of its content. Manchester encoding is the simplest of these coding mechanisms and has a lower probability of error compared to other codes [1], [2]. Differential Manchester coding may appear to be superficially the same as Manchester encoding. Unless we know which code is being used, we cannot determine the encoding just by examining the data. FM0 encoding is otherwise known as bi-phase space encoding [3]. In this paper, we modify the existing architecture for FM0/Manchester encoding in [4] to incorporate Differential Manchester code. It focuses on efficient allocation of hardware components to perform the three encoding operations with maximum hardware utilization. This architecture can be used in applications where the system has to switch between different encoding schemes. Having a separate circuit for each encoding method would consume more resources.

II. RELATED WORK

Different types of baseband coding schemes have been in practice for improving performance of communication systems. Here, the discussion is restricted to digital systems. Manchester, Differential Manchester and FM0 Codes are commonly used in short range communication systems like RF. The encoded signals have good DC balance. A signal is said to be more reliable if it has good DC balance.

Combining the use of Manchester and Differential Manchester for different intervals in the same data sequence facilitates data protection [2]. A key will be used to specify the type of encoding used.

In [5], hardware reused architecture for FM0/Manchester encoder is proposed. The original unbalance type architecture has a poor hardware utilization rate (HUR) of 50%. A modified architecture is proposed which balances the computation load between Manchester and FM0. This technique simplifies the Boolean expressions to have common terms. It achieves a hardware utilization rate to 90%.

In [4], the FM0/Manchester encoder of [5] is improved to achieve 100% HUR. Retiming and logic sharing techniques are used to obtain improvement. This architecture is fully reusable and offers competitive performance when compared with other previous works.

Reference [6] proposes a fully reused FM0/Manchester codec for dedicated short range communication (DSRC) based sensor nodes. It has 100% hardware utilization and reduced number of transistors. However, power consumption becomes a tradeoff for HUR.

In [7], the authors propose a modified Manchester/Miller encoder for RFID applications. It has a simple circuit structure and is capable of operating at high frequency. Hardware sharing is adopted to reduce the number of

Design and Implementation of Sequential Microprogrammed FIR Filter Using Efficient Multipliers on FPGA

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ABSTRACT

Finite Impulse Response Filter plays an important part in digital signal processing applications such as video, audio and image processing. The performance of FIR filter is improved by using efficient multipliers and adders. In this paper 8 tap sequential microprogrammed FIR filter architecture is implemented using Wallace tree and Vedic multiplier. The designs are realized using Xilinx Virtex-5 FPGA. FPGA results are presented and analysed. Implementation results shows that in the proposed method FPGA resource utilization is improved in both Wallace tree and Vedic multiplier compared to the existing work. Hence proposed method is more efficient.

Keywords: FIR Filter; microprogrammed, FPGA, multiplier

1. INTRODUCTION

Digital filters are the discrete time systems that are used for filtering of arrays. The filtering operations performed in filtering operations are low pass, high pass, band pass and band reject. The basic building blocks for the implementation of digital filters are adders, multipliers and shift registers. The transfer function can be achieved by realizing the different architectures of digital filters.

Finite Impulse Response (FIR) and Infinite Impulse Response (IIR) are the two digital filters used in many applications such as image, signal, audio and video processing. Frequency response characteristics of a FIR filter can be realized by varying the weights of the filter coefficients and number of filter taps. The FIR filter performance is better than analog filter techniques. FIR filters performs convolution on window of N data samples which can be expressed as follows [1].

$$Y(n) = \sum_{i=0}^{N-1} H(i).X(n-i)$$

In general for N-tap or (N-1)th order FIR filter consists of N shifters, N multipliers and N-1 adders. The implementation of transposed form FIR filter is shown in Fig. 1.

The objective of this paper is to design sequential microprogrammed FIR filter architecture for 8 tap using Wallace and Vedic multipliers and implementation on FPGA.

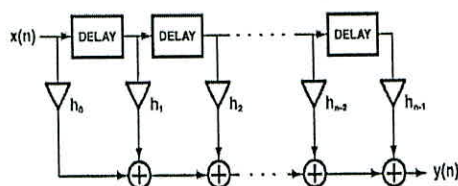


Fig. 1 Transposed form FIR filter [7]

2. MICROPROGRAMMED FIR FILTER

The microprogrammed FIR filter consists of microprogram control unit and data path unit. The advantage of microprogrammed control unit is its flexibility, many additions and any changes can be done by changing the microinstructions in the memory.

E-Health Care Smart Networked System

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Abstract:

This is particularly the case on e Health monitoring applications for chronic patients. Where Patients monitoring refers to a continuous observation of patient's condition (physiological and physical) traditionally performed by one or several body sensors. The architecture for this system is based on medical sensors which measure patients' physical parameters by using wireless sensor networks (WSNs). These sensors transfer data from patients' bodies over the wireless network to the cloud environment. The system is aimed to prevent delays in the arrival of patients' medical information to the healthcare providers. Therefore, patients will have a high quality services because the e health smart system supports medical staff by providing real-time data gathering, eliminating manual data collection, enabling the monitoring of huge numbers of patients. We underline the necessity of the analysis of data quality on e-Health applications, especially concerning remote monitoring and assistance of patients with chronic diseases.

Keywords — -

I. INTRODUCTION

Wireless Sensor Networks (WSNs) have facilitated the way for development of various aspects of sensing. WSNs have been applied in different applications such as military applications, climate monitoring applications, underwater networks applications, and structural health monitoring applications. WSN are facing many challenges such as limited computing power, memory capacity and data transmission capabilities. Thus, using cloud computing would be an appropriate solution to improve sensors efficiency.

Cloud Computing is a general expression for any technological services provide through the Internet [1]. Cloud computing provides compatible and on-demand network access for numerous computing resources such as networks, systems, applications, and services. Moreover, cloud computing are using modern and flexible methods to provide, manage, and pay for information technology services with minimal management effort and cost. Cloud computing technology has several advantages such as flexibility, highly auto-mated, low cost, fast services providing, and a huge storage capacity. The Cloud's features enable customers to build, test, and deploy their applications on virtual servers using different infrastructures and multiple operating systems. Cloud service providers offer three different types of services in order to obtain their customers more flexibility, which are Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS). SaaS provides remotely access to software applications and their functions as a Web based service. (PaaS) offers application frameworks and

operating systems, obtains to minimize the development efforts, and provides many applications in the cloud for users without installing any framework or software on their machines. (IaaS), offers a pool of cloud computing resources, including hardware, servers, networking components, and a massive storage space. Finally, cloud computing offers unlimited data storage. Therefore, the organizations and users who are using the cloud do not need to be concerned about the size of their files.

Amazon Web Service (AWS) is one of the famous cloud providers which provides infrastructure as a service with different types of services such as, Amazon Elastic Compute Cloud (EC2). Amazon EC2 is a cloud service that designed to make web-scale computing easier for developers and to provide flexible compute capacity in the cloud. In this paper, we focus on the idea of integration between wireless sensor network and cloud computing. After health sensors that are connected to patients' bodies collect and transmit data to the cloud, services which are available in this cloud are responsible for receiving, storing, processing, and distributing this data. We suppose that this solution offers an appropriate scenario to provide a comprehensive telemedicine service which automates the processes from collecting patients' data to delivering compatible medical decisions based on patients' current conditions and their historical medical data.

The contributions of this paper are:

- A framework for integrating WSN and cloud computing.
- A prototype implementation using e-health sensors and the Raspberry Pi.
- Improve the sensor Efficiency

IoT Based E-Health Monitoring System

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Abstract— Design and implementation of an e-health smart Networked system. Particularly in the case of e Health monitoring applications for chronic patients, Where Patients monitoring refers to a continuous observation of patient's condition (physiological and physical) traditionally performed by one or several body sensors. The system is aimed to prevent delays in the arrival of patients' medical information to the healthcare providers, particularly in accident and emergency situations, to stop manual data entering. The architecture for this system is based on medical sensors which measure patients' physical parameters of patient by using wireless sensor networks (WSNs). These sensors transfer data from patients' bodies over the wireless network to the cloud environment. Therefore, patients will have a high quality services because the e health smart system supports medical staff by providing real-time data gathering, eliminating manual data collection, enabling the monitoring of huge numbers of patients. Enable remote monitoring and assistance of patients with chronic diseases.

Key words: Frequent Pattern Mining, High Utility Itemset Mining, Transaction Database

I. INTRODUCTION

Wireless Sensor Networks (WSNs) have facilitated the way for development of various aspects of sensing. WSNs have been applied in different applications such as military applications, climate monitoring applications, underwater networks applications, and structural health monitoring applications. WSN are facing many challenges such as limited computing power, memory capacity and data transmission capabilities. Thus, using cloud computing would be an appropriate solution to improve sensors efficiency.

Cloud Computing is a general expression for any technological services provide through the Internet [1]. Cloud computing provides compatible and on-demand network access for numerous computing resources such as networks, systems, applications, and services. Moreover, cloud computing are using modern and flexible methods to provide, manage, and pay for information technology services with minimal management effort and cost. Cloud computing technology has several advantages such as flexibility, highly auto-mated, low cost, fast services providing, and a huge storage capacity. The Cloud's features enable customers to build, test, and deploy their applications on virtual servers using different infrastructures and multiple operating systems. Cloud service providers offer three different types of services in order to obtain their customers more flexibility, which are Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS). SaaS provides remotely access to software applications and their functions as a Web based service. (PaaS) offers application frameworks and operating systems, obtains to minimize the development efforts, and provides

many applications in the cloud for users without installing any framework or software on their machines. (IaaS), offers a pool of cloud computing resources, including hardware, servers, networking components, and a massive storage space. Finally, cloud computing offers unlimited data storage. Therefore, the organizations and users who are using the cloud do not need to be concerned about the size of their files.

Bebotte is cloud platform for real-time connected objects connecting anything and everything in real-time using rich API supporting REST, Web Sockets and MQTT. Design to empower Internet of Things and real-time communicating applications. Beebotte brings you a platform as a service connecting thousands of objects and delivering millions of messages. One platform suited for diverse applications like instant messaging, dashboards, online gaming and score boards, domotics, Internet of Things and reporting. Seamless scalability to meet your growing demands. Redundant architecture hosted with Amazon's AWS for high availability

In this paper, focus on the idea of integration between wireless sensor network and cloud computing. After health sensors that are connected to patients' bodies collect and transmit data to the cloud, services which are available in this cloud are responsible for receiving, storing, processing, and distributing this data. Suppose that this solution offers an appropriate scenario to provide a comprehensive telemedicine service which automates the processes from collecting patients' data to delivering compatible medical decisions based on patients' current conditions and their historical medical data.

The contributions of this paper are:

- A framework for integrating WSN and cloud computing.
- A prototype implementation using e-health sensors and the Raspberry Pi.
- Improve the sensor Efficiency
- Applying data mining technique to extract an appropriate decision based on patient's condition and historical data.

II. MOTIVATION

Providing healthcare services is very important for people specially who have chronic diseases. Those people need continuous healthcare which cannot be provided outside hospitals. There are a variety of technologies around us, so to get benefits from connecting such technologies to build a new e-health system platform could help to achieve high quality health care services. There are many reasons which motivate us to build this platform: (1) making healthcare more accessible for people who do not have access to healthcare providers in their communities; (2) making healthcare easier for people who do not have access to public transportation in order to go to hospitals; (3)

MINIATURISATION OF PATCH ANTENNA USING NOVEL FRACTAL GEOMETRY

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ABSTRACT

In the Field of low profile antenna micro strip patch antennas have attracted many researchers due to small size and low cost of fabrication. One of trending member of new designs is Fractal antenna. Fractal shapes are recursive/repetitive self-similar geometries, due to this self-similarity they can provide high gain, multiband, wideband solutions and design miniature antenna. Fractal shapes are widely used in computing, analysis and design; recent trends suggest positive outcomes of using fractal shapes in electromagnetics and communication system. In this paper Jerusalem cube fractal shape is introduced in probe fed conventional patch antenna for L1 band. A dual band antenna resonating at 1.41 GHz (L) and 3.37 (S) GHz, band is constructed using said fractal shape. The comparison of Return loss, Gain, VSWR, % miniaturisation and radiation patterns are shown with conventional patch antenna. Analysis is done on RT duroid 5880 with dielectric constant $\epsilon_r = 2.2$. The novel fractal antenna is designed, simulated using an soft HFSS 13.0.

Key words: Fractal Antenna, Jerusalem Cube Fractal, Miniaturisation, Patch Antenna

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1. INTRODUCTION

Advancements in Wireless communication have paved the way for many researchers to make the system smarter and smarter. In most of RF and Microwave applications antenna plays an important role, As per the IEEE std.145-1983 the antenna is considered as means for radiating or receiving radio waves. Theoretically they are the transducers which convert RF signal into Electromagnetic waves and viceversa. Antenna in early days used to be voluminous and high profile.

Transform Domain Based Iris Recognition using EMD and FFT

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Abstract: Iris is one of the physiological trait which is used to identify the individuals. In this paper Transform Domain Based Iris Recognition using EMD and FFT is proposed. Circular Hough Transform is used in the Preprocessing stage to extract circular part of eye. The circular iris part is converted into rectangular rubber sheet model in Region of Interest (ROI). Empirical Mode Functions (EMF) 's are obtained by applying Empirical Mode Decomposition (EMD) on the Iris. FFT is also applied on ROI to extract the features. These features are added arithmetically to obtain final features. The features of the database are compared with test iris using Euclidian Distance(ED) to compute performance parameters. It is observed that the values of CRR and EER are better in the case of proposed algorithm compared to existing algorithms.

Keywords: Iris Recognition, EMD, FFT, ROI, ED and Fusion

I. Introduction

Biometrics is used to authenticate a person based on physiological and behavioral characteristics of human beings. The physiological traits are Face, Fingerprint, Palm print, DNA and Iris of a person is constant in nature throughout their lifetime. The behavioral traits are Signature, Voice, Keystroke and Gait of a person are based on mood, age and surrounding circumstances, hence are not constant in their life time. The iris is considered for our research work as it is unique, non-invasive features to recognize human beings properly. Iris is a circular part of an eye and lies between sclera and pupil. The iris is an internal organ of human and is well protected compared to other physiological traits. The disadvantage of an iris is that the person has to co-operate to acquire iris image and also the iris image cannot be acquired from long distances. The application of iris recognition system is widely used in airport checking, refugee control, military applications, homeland security, various private and public sectors and the national identification AADHAR systems.

Contribution- In this paper IRFEF algorithm is proposed. The ROI area is extracted from iris using preprocessing. The EMD and FFT is then applied on ROI to generate individual feature vector. The final feature vectors are obtained by fusing individual features. The ED is used to compare test image features with the database image features.

Organization- The paper is organized as section 1 is introduction. The related literature survey is discussed in section 2. The proposed model is described in section 3. The algorithm is presented in section 4. The performance analysis and conclusions are given in section 5 and section 6 respectively.

II. Literature Survey

The application and usage of Iris as a biometric characteristic for individual identification with different technique are described in this section. Ya-Ping Huang et al., [1] proposed an Iris Recognition System which adopts Independent Component Analysis (ICA) in which the iris pattern is represented by ICA coefficients. It determines the centre of each class by competitive learning mechanism to recognize the iris pattern. Tisse et al., [2] proposed a technique which is based on the extraction of instantaneous features in the Iris texture which are the emergent frequency and/or instantaneous phase. It is an alternate solution to Daugman's mathematical algorithms for local feature extraction, which allows adjusting the size of the biometric signature without increasing the computation complexity. Daugman [3] is implemented integro-differential operators to detect the inner and outer Iris boundaries. 2-D Gabor filters are applied to extract unique binary vectors constituting an Iris features. Daugman used a statistical matcher (logical exclusive OR operator) which computes the average Hamming Distance between two Iris codes. Hui Zheng and Fei Su [4] proposed an iris recognition using Gabor wavelet method; it includes the iris localization, eyelids detection and the optical filter parameters selection. Lahouari Ghouti and Fares S. Al-Qunaieer [5] proposed Quaternion Phase Correlation for color iris recognition based on a new hyper complex phase-based color iris recognition and matching method is used which has greater accuracy, flexibility in capturing the color iris information and reduces the complexity. Ghassan J. Mohammad and Hong Bin Kung et al., [6] proposed an efficient iris localization algorithm based on Angular Integral Projection Function method. The algorithm adopts boundary point detection along with curve fitting and it does not require to find all the boundary points so the localization

RESEARCH ARTICLE

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Face Recognition based on STWT and DTCWT using two dimensional Q-shift Filters

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ABSTRACT

The Biometrics is used to recognize a person effectively compared to traditional methods of identification. In this paper, we propose a Face recognition based on Single Tree Wavelet Transform (STWT) and Dual Tree Complex Wavelet transform (DTCWT). The Face Images are preprocessed to enhance quality of the image and resize. DTCWT and STWT are applied on face images to extract features. The Euclidian distance is used to compare features of database image with test face images to compute performance parameters. The performance of STWT is compared with DTCWT. It is observed that the DTCWT gives better results compared to STWT technique.

Index Terms: Biometrics, DTCWT, STWT, ED, Two dimensional Q-shift filters, Face recognition

I. INTRODUCTION

The biometrics is used to recognize a person based on physiological and behavioral traits. The physiological traits are fingerprint, iris, face, palm print, DNA etc., are depends on physical characteristics of a person and are almost constant throughout lifetime. The behavioral traits are signature, keystroke, voice, gait etc., are depends on behavioral characteristics of a person and are not constant in the lifetime of a person and are depends upon mood and circumstances. The advantages of biometrics identification are biometric traits cannot be lost or forgotten or stolen as they are permanently attached to persons. The biometrics can be used as long as it satisfies universality, distinctiveness, permanence, collectability and acceptability.

The face biometric trait is powerful among all biometric traits as samples of face images are acquired using nonintrusive method and without any cooperation of a person. The steps adopted in face recognition are (i) acquire of face images, (ii) preprocessing, (iii) feature extraction, (iv) matching. In preprocessing the face color images are converted into gray scale images, image resize, illumination compensation, angle rotation etc., are performed. In feature extraction, the spatial domain features are extracted directly from an image, the transform domain features are extracted by converting spatial domain image into transform domain image using transforms such as Fast Fourier Transform (FFT), Discrete Cosine Transform (DCT), Short Time Fourier Transform (STFT), Discrete Wavelet Transform (DWT), DTCWT etc. In matching section the features of test images are compared with features of face images in the database using Euclidian

Distance (ED), Hamming Distance (HD), chi-square, Neural Network (NN), Support Vector Machine (SVM), Linear Discriminant Analysis (LDA), and Random Forest (RF) etc.

The biometrics is used in financial transactions, property documents, intellectual property protection, law enforcement, medical records, access to computer and internet etc.

Contribution: In this paper, face recognition based on STWT and DTCWT are compared. The features of face images are extracted using STWT and DTCWT. It is used to compute performance parameters.

Organization: This paper is organized into following sections. Section II is an overview of related work. The proposed model is described in Section III. Performance Analysis of the system is presented in Section IV and Conclusions are contained in Section V and references are given in section VI

II. RELATED WORK

Alaa Eleyan et al., [1] have introduced a face recognition method using DTCWT. PCA is used for face classification which is a linear dimensionality reduction technique. The DTCWT gives better result compares to Gabor wavelet transforms in terms of recognition rate. Zhongxi Sun et al., [2] have proposed a method for face recognition using DTCWT features with 2DPCA. DTCWT has advantage over DWT as it provides local multi-scale description of images with good directional selectivity and shift invariance. DTCWT is robust to illumination variations and facial expression changes. Results have shown that using this technique it's possible to capture the local information of different position, orientation and scales. Sun Yuehui and Du

Artificial Generation of Visual Evoked Potential to Enhance Visual Ability

A. Vani, M. N. Mamatha

Abstract—Visual signal processing in human beings occurs in the occipital lobe of the brain. The signals that are generated in the brain are universal for all the human beings and they are called Visual Evoked Potential (VEP). Generally, the visually impaired people lose sight because of severe damage to only the eyes natural photo sensors, but the occipital lobe will still be functioning. In this paper, a technique of artificially generating VEP is proposed to enhance the visual ability of the subject. The system uses the electrical photoreceptors to capture image, process the image, to detect and recognize the subject or object. This voltage is further processed and can transmit wirelessly to a BIOMEMS implanted into occipital lobe of the patient's brain. The proposed BIOMEMS consists of array of electrodes that generate the neuron potential which is similar to VEP of normal people. Thus, the neurons get the visual data from the BIOMEMS which helps in generating partial vision or sight for the visually challenged patient.

Keywords—Visual evoked potential, OpenViBe, BioMEMS, Neuro prosthesis.

I. INTRODUCTION

THE brain is the most complex part of the body. The function of the human body is frequently associated with the signals of electrical, chemical, or acoustic origin. Such signals convey information which may not be immediately perceived but which is hidden in the signal's structure. This information has to be "decoded" or extracted in some way before the signals can give meaningful interpretations. The neural signals reflect the properties of their associated organs, and decoding this signal is found to be very helpful in various diagnoses.

VEP is one such signal that indicates the eye's electrical activity; it is widely used in eye-related research studies. The generation of VEP by applying various signal processing algorithms and simulation helps to develop a system which aims to provide a functional central vision to assist with tasks such as face recognition and object detection.

Since visually impaired people have damaged eyes, the reason of their loss of sight is that their natural photoreceptors (eye) are unable to generate signals that excite the neurons in the occipital lobe of the brain. The temporal lobe in the brain is responsible for the visual sensation. It is proved that the neurons of the occipital lobe of the blind are healthy and have a potential to create visual sensation, if the required signals are fired to the neurons in that region. Hence, we discuss a

technique of transmitting visual data digitally into the occipital lobe of the brain by wireless means. In the brain, a BIOMEMS can be implanted to receive this wireless digital data by using patch antenna present on it. Digital data tapped by patch antenna are converted into analog signal by using a resistor controlled Wein bridge oscillator. Obtained analog signal is equivalent to the signals that are required by the occipital lobe neurons to create visual sensation in human beings.

The visual sensation occurs in temporal lobe, but the image processing in the human beings is done in the occipital lobe of the brain. Our main objective is to generate the same image processing signals in blind people's mind. The brain signals also referred as VEP are obtained from EEG tests of normal people. These signals serve as a means of reference for us to design our system [1].

II. LITERATURE SURVEY

The development of several neuro-prosthetic aid or devices such as developing a bionic eye to restore vision to people with retinitis pigmentosa and age related macular degeneration and many other visual problems, is very essential for the human society. Several government and private agencies have taken a research projects related to development of visual aided devices.

The BioMEMS that can be implanted on the human brain are described in [2]. It uses heterogeneous integration of 100-element micro-electro-mechanical system (MEMS) electrode array, front-end CMOS integrated circuit for neural signal pre-amplification, filtering, multiplexing and analog-to-digital conversion, and a second CMOS integrated circuit for the transmission of neural data wirelessly and conditioning of the neural signal. The Prosthesis is the process of generating the electrical signal to simulate any paralyzed limbs and control the operation of any part of subject. Flip-chip technology can be chosen for the integration of the electronics and MEMS electrode array to accommodate the high density of interconnections [3], [4].

An overview on the use of micro-electro-mechanical systems (MEMS) technologies for timing and frequency control is presented. The vibrating RF MEMS are seen frequently as circuit building hinders than as stand-alone device. The analysis of EEG signal and extraction of VEP signal with the help of case studies and examples are described by Rangayana [5].

III. IMAGE ACQUISITION AND PROCESSING

A digital camera is used to capture the image. The obtained images are then subjected to pre-processing. Viola Jones

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Multi-objective Genetic Algorithm for Optimal Power Flow Including Voltage Stability

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A MOGA for solving the multi-objective optimal power flow (OPF) problem is proposed in this paper. In this method, in the genetic population, the optimization variables are represented in their natural form. The algorithm ensures non-dominated solutions and simultaneously maintains diversity among the non-dominated solutions. The new algorithm applied to an IEEE 30 bus system. The Pareto-optimal front obtained from MOGA is compared with reference Pareto front which is obtained with multiple... CONTINUE READING

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ABSTRACT

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Study on polypropylene a c capacitors and its time dependence of loss tangent

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Abstract: Measurements are presented of the decrease of loss tangent with time of application of a high alternating stress and its return on removal of the stress. Measurements were made at an elevated temperature, as well as at ambient conditions. An explanation of the phenomena in terms of the movement of charge carriers into the polymer and their recombination within the polymer is attempted.

Keywords: Dielectric materials, Organic insulating materials, Polymer.

I. Introduction

Although the ESR (equivalent series resistance) figure of a capacitor is mentioned more often, dissipation factor and loss tangent are also widely used and closely associated with the capacitor ESR.

Although dissipation factor and loss tangent are effectively the same, they take slightly different views which are useful when designing different types of circuit. Normally the dissipation factor is used at lower frequencies, whereas the loss tangent is more applicable for high frequency applications. The loss tangent is the tangent of the difference of the phase angle between capacitor voltage and capacitor current with respect to the theoretical 90 degree value anticipated, this difference being caused by the dielectric losses within the capacitor.

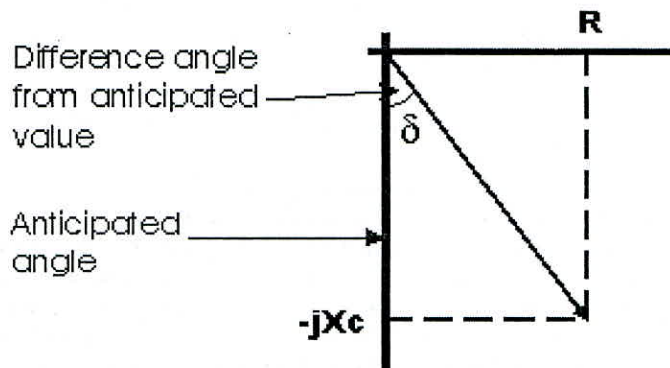


Fig.1: Capacitor loss tangent.

$$\tan \delta = \text{ESR} / X_c$$

There are two deviations from simple linear dielectric behaviour to be found in liquid-impregnated capacitors. There is the well known Garton effect, ie, effectively a decrease in loss tangent with increasing applied measuring voltage, and there is a progressive fall in loss tangent during prolonged application of a high alternating stress. The latter effect is no so well documented, and we present some new experimental results as well as attempting an explanation of the phenomenon.

II. Experimental details

The capacitors investigated consisted of windings made with 6μm thick aluminium-foil electrodes and either 2-layer dielectrics of 2 x 12.7 μm polypropylene film or 3-layer dielectrics, where a paper layer (10 μm thick, density 1.0g cm⁻³) was inserted between the two polypropylene films. The windings were flattened, and were vacuum- impregnated with epoxy-stabilised trichlorodiphenyl (t.c.d.p.) at a temperature of 60°C. The 2-layer samples had a capacitance of 0.23 μF, the 3-layer ones 1 μF.

Capacitance and loss tangent measurements were made with an ampere-turns balance transformer bridge at 50 Hz using a tuned detector. The absolute accuracy of tan δ measurement is estimated as ± 5 x 10⁻⁵, and repeatability is ± 1 x 10⁻⁵

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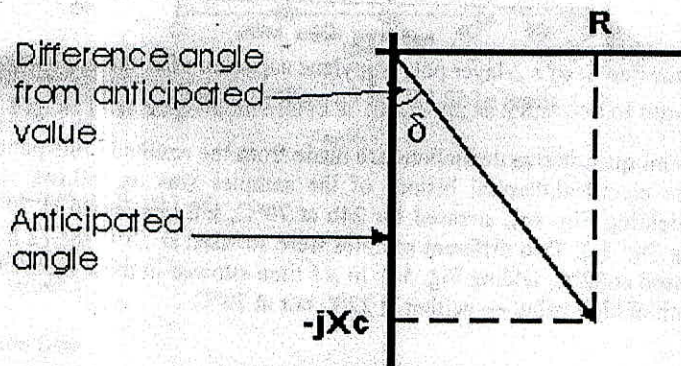


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An Optimal Technique to Limit the Harmonics Level in Brush Less Alternators

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ABSTRACT: Harmonic parameters of synchronous machine greatly affect its performance during steady state operation and also during faults and transient. The Harmonics in generated voltage waveforms are often the cause for excessive heating and tooth tip saturation and compel de-rating of such machine, because of this problem it needs to analyze the harmonic content for improving the quality of performance. This paper is focused on investigation and evaluation of harmonics levels, for calculation of proper design input parameters. Hence in this paper we discuss a novel technique to overcome this problem at the design level itself, by introducing the software tool for predetermining the design input data.

Keywords: Harmonic distortion analysis, Design input data, soft ware tool, Brushless alternators.

INTRODUCTION

Several different technologies are used in alternators to analyze harmonics. Here using a brush less alternator to analyzing the harmonics and minimization of its effects. Majorly harmonics generated in voltage waveforms and in slot tooth.

In the first case harmonics can be minimized by using distributed winding instead of concentric winding; hence we can obtain distribution factor and chording factor for different harmonic orders.

And also the slot harmonics has to be limit to achieve limited total harmonic distortion. This slot harmonics are mainly depends on the slot pitch. By varying slot pitch we can get different harmonic orders and proper design data regarding slots.

In order to achieve this proper design input data I am introducing a new software tool technique, in this I can predefine the design data for different harmonic orders.

BRUSHLESS ALTERNATOR:

All synchronous generators function as magnetic energy conversion devices to convert mechanical power into electrical power by means of magnetic fields. The input torque provided by the prime mover (the turbine) is balanced by the magnetic torque between the stationary and rotating structures in the generator.

Several different approaches are possible to accomplish this power conversion function. For the larger synchronous generators that are primarily discussed in this section, the magnetic fields are typically established by electrical currents circulated in stationary ac windings, and rotating dc windings, and these magnetic fields are circulated within the generator through highly permeable steel structures. In such a generator, the ac winding is electrically connected to an electrical power system and physically mounted on the stationary member of the generator (the stator), and the dc winding is electrically connected to a dc power source and physically mounted on the rotating member of the generator (the rotor). Because of the prevalence of poly phase power generation, distribution, and utilization, the ac winding in all but the smallest synchronous generators is generally a poly phase winding.

The most common number of phases is three. All larger synchronous generators include an ac armature winding and a dc field winding. The electromagnetic interaction of these two windings provides the basis for ac power generation. In some of the smallest synchronous generators, with ratings below a few hundred kilowatts, the magnetic function of the dc field winding is provided by permanent magnets. In all large synchronous generators, the dc field is provided by a dc field winding.

Supercapacitor Power Management Using Boost Converter Renewable Energy Fed DC Motor

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Abstract— This paper implements a smart boost converter fed DC motor which is powered by photovoltaic cells/ battery. A 220V, 0.8A universal motor which is driven by boost converter and Supercapacitor is used to deliver required power to the load during transient period. Large electric drives require advanced power electronic converters to meet the high power demands. With the shortage of the energy and ever increasing of the oil price, research on the renewable and green energy sources, especially the solar arrays and the fuel cells, becomes more and more important. How to achieve high step-up and high efficiency DC/DC converters is the major consideration in the renewable power applications due to the low voltage of PV arrays and fuel cells. This converter provides the constant output voltage irrespective of the PV panel output and load. The simulation and experimental results of this system are presented and compared. The performance of the converter is also compared with the conventional boost converter. This comparison reveals that the proposed converter system has the advantages of high gain and high efficiency with the minimum number of components. This thesis aims to explain the knowledge about the performance of the boost converter and the performance is analyzed by way of simulation. The variations at the load is overcome by using Supercapacitor and the balancing of Supercapacitor is done.

ex Terms - Boost converter, DC motor, Supercapacitor, Power management

1 INTRODUCTION

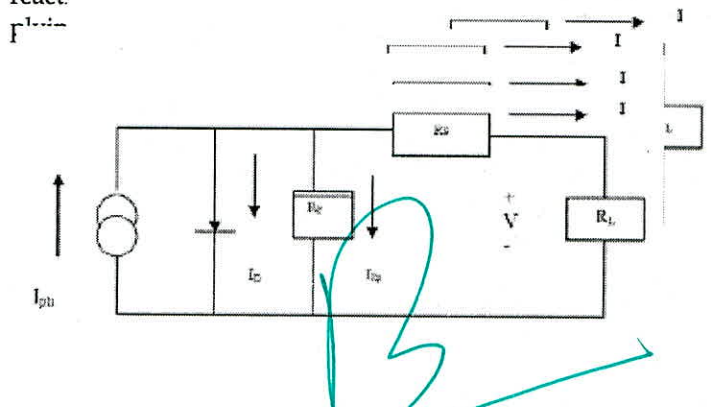
The usage of the fossil fuels, such as the oil, the coal and the gas, result in serious greenhouse effect and pollute the atmosphere, which has great effect on the world. Meanwhile, there is a big contradiction between the fossil fuels supply and the global energy demand, which leads to a high oil price in the international market recently. The energy shortage and the atmosphere pollution have been the major limitations for the human development. To find renewable energy is becoming more and more exigent. Photovoltaic (PV) sources are one of the significant players in the world's energy portfolio and will become the biggest contributions to the electricity generation among all renewable energy candidates by year 2040 because it is truly a clean, emission-free renewable electrical generation technology with high reliability. The task of a maximum power point tracker (MPPT) in a photovoltaic (PV) energy conversion system is to continuously tune the system so that it draws maximum power from the solar array regardless of weather or load conditions. Since the solar array has a non-ideal voltage-current characteristic and the conditions such as insulation, ambient temperature, and wind that affect the output of the solar array are unpredictable, the tracker must contend with a nonlinear and time-varying system. Many tracking algorithms and techniques have been developed.

The limitations of the conventional boost converters are analyzed and the conceptual solution for high step-up conversion is proposed in this paper. Then the state-of-the-art topologies are covered and classified based on the circuit performance. The challenges in high step-up renewable energy applications are summarized to generate the next generation non-isolated high step-up DC/DC converters.

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2 LITERATURE SURVEY

Electric motors have broad applications in such areas as industry, business, public service and household electrical appliances, powering a variety of equipment including wind blowers, water pumps, compressors and machine tools. In industrially developed nations and large developing nations, electric motors account for a considerable proportion of total national power consumption. Statistics indicate that electric motors are generally responsible for about 2/3 of industrial power consumption in each nation, or about 40% of overall power consumption. By introducing variable speed to the driven load, it is possible to optimize the efficiency of the entire system, and it is in this area that the greatest efficiency gains are possible. Power factor correction equipment that can be applied at the motor level will not only decrease energy use but will significantly extend the life of the equipment. Additionally, it also maximizes the capacity of the power system, improves the quality of voltage, and reduces the power losses. In order to decrease the cost and to improve the efficiency, the react



Novel Framework for Predicting Fault Tolerance using Stochastic Modelling on Distributed Power Line Transmission

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²Jain University, Bengaluru, India

Abstract

The usage of renewable power sources are the best alternatives to solve the problems of constantly saturated conventional energy sources in very near future. However, owing to the time-variant properties of renewable resources, it is very challenging task to ensure its resiliency towards utility failures unlike in existing distributed generation system does today. We reviewed the existing system to find that studies towards forecasting of failures are still open-end problems. Therefore, this paper presents a novel framework those targets to incorporate a predictive modelling scheme efficient enough to withstand dynamic interruption by consistently supplying local load. A stochastic modelling is carried out for computing capacity, demands, as well as outage using analytical research methodology. The study outcome was compared with most frequently practiced forecasting technique to find that proposed system offers better power capacity with very less errors for larger customer base.

Keywords: Power Transmission, Prediction, Outage, Stochastic Approach, Fault Tolerance

1. INTRODUCTION

The existing forms of the power transmission network targets mainly to leverage the higher degree of fault tolerant performance [1]. Such incorporation of fault tolerance is obtained by integrating additional hardware-based resource that has the capability to perform better reconfiguration of the network in to more efficient manner. However, such operation includes more cost of new components and doesn't offer reliability at same time [2]. With the increasing demands of the users, the future demands of the power distribution changes are in constant pace of upgradation [3]. Incorporation of such features calls for proper assessment of resiliency towards potential failures along with minimization of outage. The area of distributive generation essentially uses both conventional as well as renewable source of energy [4][5], where still majority of the developing country still uses conventional sources of energy which is saturating very fast. This leads to emphasize on the future usage of renewable energy whose adoption in power generation is increasing in a faster pace [6]. Although, usage of renewable energy sources are the only best alternative at present as well as in future for applying it in the process of distributive generation system, but it is shrouded with some potential problems. The first problem associated with the usage of renewable sources is its increased dependencies on various input which often changes in different circumstances of usage. The energy that is produced from such form of energy sources also includes higher fluctuation that makes it very much challenging for its behavior to be detected in future [7]. There are certain applications in power transmission system (e.g. industrial, emergency, healthcare, etc), which demands highest level of resiliency towards any form of faults. On the other hand, the biggest problem in using renewable source of energy is that it is very difficult to extract a particular trend in its behavior where prediction can be made accurately. In such situation, there is all the possibilities of non-matching of supply factor and actual demands owing to various forms of possible interruption that will be surfaced by using renewable resources in distributive generation. Therefore, in presence of any form of interruption, the source of distributive generation is often subjected to disconnection. The extent of distributed generation towards trustworthiness resides in the side of user and never for any component of utility causing the system to be pretty expensive at present. However, it should be noted that a better form of fault tolerance can only be offered if involved components as well as utilities in distributive generation is protected well. One way to do so is to perform proper identification of failure type and another way is to ensure seamless transmission of load when the system encounters a condition of power interruption. However, at present, both the solutions are hard to be retained at same time. For better solution, it is anticipated that occurrences of failures should be as low as possible along with a hope of enhancing the system tolerance level by supplying load during the mode of islanding process. At present, there are availability of various forms of prediction-based algorithms [8][9][10] trying to solve complex forecasting problems, however, they cannot be directly applied on such distributed generation system

An Enhanced Cat Swarm Optimization for Power Loss Minimization in Distributed Power Flow Controller

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²RNS Institute of Technology, India

Abstract—Voltage instability and power loss scenarios are the most common problems in power systems. This paper deals with the proposal of Cat swarm optimization Algorithm [CSO] and Genetic Algorithm [GA] in FACTS Controller for voltage stability improvement and minimization of the power loss. CSO Model in this system is been used to solve the problem of voltage instability. CSO model is based on the cat nature, which is categorized into searching and trapping schemes.. In a Distributed Power Factor Correction [DPFC] scheme, voltage stability improvement is a key factor due to the chance of more losses in the transmission system. The Voltage stability improvement will be perpetuated by the optimally placing and sizing of the IEEE 64 bus In DPFC System. For sizing and placing, GA is used. The proposed technique is implemented in MATLAB SIMULINK and tested for IEEE 14, 30, 57 and 118 bus systems respectively.

Keywords- Bus, Cat, CSO, DPFC, Genetic Algorithm, GA, RTS, Power Factor, Voltage Level Balancing, Power Loss.

I. INTRODUCTION

In today's fast growing technical world Power Quality management is the most important concern. For improving the power quality, the power electronic system devices like Versatile AC Gear [FACTS] are required to achieve the new power management capabilities. The moderation of FACTS devices based on empowered power management scheme and signified semi-conductor changes, an innovative approach is required to maintain the quality and avoiding the loss in power factors. In conventional systems, passive L-C filters are used to break the reverse harmonics as well as the capacitors are used to boost up the power issues.

Apart from the all specified things, passive filters by default have certain limitations such as accumulating recompense, large size and resonance. For these reasons, in conventional systems, a new method of Unified Power Flow Controller [UPFC] was introduced, to resolve the problems quoted above and achieve the high power stability and minimum amount of power loss strategies.

II. UNIFIED POWER FLOW CONTROLLER [UPFC]

UPFC is considered as a most powerful device which might at the same time, managing power factors with all

the parameters of the system like line resistivity, transmission angle, bus voltage and so on. UPFC is that the mixture of Static Compensator (STATCOM) and Static Synchronous Series Compensator (SSSC) coupled via a standard DC link. The UPFC model usually provides higher support with the following applications such as: (a) Enhancing the transient stability of inter area power systems, (b) Employ for tacking power system fluctuation, (c) for improving microgrid voltage profile, (d) for improvement of voltage profile and reduction of losses and (e) Employs in High Voltage DC transmission systems.

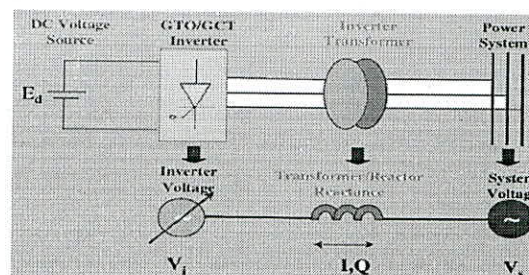


Figure 1. Static Compensator [STATCOM] Schematic Design

III. STATIC COMPENSATOR [STATCOM]

The urgency of FACTS instruments and especially GTO thyristor based STATCOM has facilitated like expertise to be employed as stern spirited substitutes to conservative SVC. A Static Synchronous Compensator [STATCOM] is a regulating tool used on discontinuous current electricity communication networks.

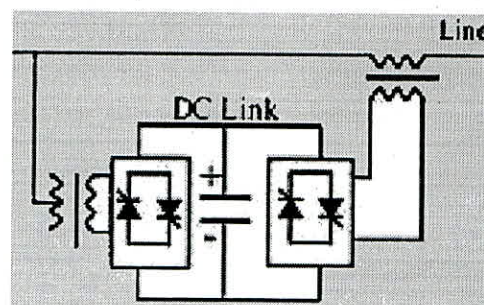


Figure 2. Structure of UPFC

It is purely based on a power electronics voltage source converter and can do something as moreover a source or sink of reactive AC power to an electricity network. If connected to a source of power it can also supply active



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Energetic Designing of Fault Analysis Model Using Cat Swarm Optimization with DPFC Implementations

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ABSTRACT: The main aim of the proposed work is to experimentally prove the efficiency of Cat Swarm Optimization Technique with Distributed Power Flow Correction (DPFC). The DPFC consists of AC-DC Serial Converter as well as Shunt Converter. Serial Converter, which connects the AC to DC converters serially and makes the fine AC output, that AC output is feeded back to IEEE-16 bus system. Each bus system consists of Cat Swarm, which monitors the incoming and outgoing voltages. If it finds any fault condition over the block it immediately notified by means of MATLAB Simulink Model. Shunt Converter, which connects the AC to DC converters parallelly and it contains transformers as well as bridges, which converts DC voltage to AC voltage and given back to the transmission line. In this system we form IEEE-16 Bus System, in that one bus acts as a master, which gives power supply to all the other buses. Each bus is connected in different logic to get different output power based on the RLC load. If any fault condition occurs into the bus system, Cat Swarm algorithm identifies the fault over the buses and informs that via resulting scopes. The Cat Swarm algorithm efficiency is compared against the genetic algorithm along with DPFC model. The experimental results prove that the Cat Swarm Optimization Algorithm with DPFC improves the power factor and identify the fault conditions better than the genetic algorithm with DPFC.

KEYWORDS: Cat Swarm Optimization, Genetic Algorithm, DPFC, UPFC, AC-DC, IEEE-16 Bus System, Power Flow Correction, Shunt Converter, Series Converter.

I. INTRODUCTION

The main objective of the system is to experimentally analyze the fault over the bus system and prove the efficiency of Cat Swarm Optimization with Distributed Power Flow Correction (DPFC) as well as compare that with Genetic Algorithm and prove CSO is better than GA. Voltage dependability is the capacity of a force framework to keep up relentless voltages at all buses in the framework under typical working conditions, and subsequent to being subjected to an unsettling influence. In the event that the transport does not keep up the consistent state esteem it is called as the voltage precariousness that may bring about the type of a dynamic fall or ascent of voltages at those transports. Power System Load demonstrating is a strategy used to display the force framework and vital for voltage strength examines. In this paper, we are attempting to investigate displaying parameters of different burdens for voltage solidness thinks about. We are performing static burden demonstrating study. The exactness and rightness of the outcomes are straightforwardly identified with the heap models utilized as a part of this investigation. The technique is examined utilizing continuation power stream schedule. Truths innovation with a blend of Cat Swarm Optimization heuristic methodology is connected to give an answer for the issue of precariousness because of different burden models. The adequacy of the proposed technique is exhibited through quantitative studies on standard IEEE 16 Bus framework.

Design of fixture for gear cover component machining on VMC

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Abstract

Gear cover is very important part of the gear transmission system, where the gear gets fixed inside firmly. It should be accurately machined with the acceptable tolerance. Also the fluctuations of dimensions in work-piece to work piece should be minimum so That it will be easier to assemble the gears inside the gear cover perfectly.

This casted gear cover component requires machining (Facing, Drilling, Tapping, Boring, Counter Boring operations as per the requirement at each faces) on four sides. At present the industry is utilizing 3 separate fixtures for machining of all four sides of the die casted Aluminium gear cover component. Due to this, the maintenance of accuracy of the machining becomes the burden on the operator to adjust the fixtures each time. This increase the setting time, handling time, tool change time. Also the cost per component increases.

The aim of this project is to design and development of a single new fixture connected to turret which replaces the old three fixtures for machining operation using designing software's i.e. Pro ENGINEERING, AutoCAD and analysis using ANSYS, which can eliminate the said problems. Also costing analysis is carried out by comparing old and newly designed fixture. The production rate will also increase up to 50% and cost per component machining decreases, which is quite objective. Thus, we are designing the fixture for such gear cover component machining for 2-wheeler excel TVS vehicle.

Keywords: fixture, clamping, holder, turret, AutoCAD, pro e, ANSYS

1. Introduction

Fixture [1] – A fixture is a work piece holding device which is rigidly fixed using fasteners on to the machine bed. It has no special arrangements to guide the tool as in jigs. In a setup using a fixture, the responsibility of accuracy is dependent on the operator and the construction of machine tool. In fixtures, the method of clamping and locating should be such that it reduces the idle time to a minimum. Fixtures vary in design from relatively simple tools to expensive, complicated devices. In order to decide upon the location method, one has to consider the work piece shape, size, surface and features that are likely to affect obstruct the tool movement.

The correct position of the work piece essentially require restricting of all Degree Of Freedom of the work piece positively. Once a work piece is located, it is necessary to press it against the locating surface and hold it there against the forces acting upon it.

1.1 Elements of Fixture [2]

- Fixture Body – This is the main structural element of the fixture. This body is designed as per the dimensions of the required component that is to be machined. In our Design, we have provided the profile cut, that fits the gear cover component on to it. And the size of the fixture body must not be heavy so that it is easy to place it on to the machining bed.
- Clamps - It is necessary hold the work piece firmly against the forces acting upon it. This action refers to as Clamping and the mechanism used for this action is called Clamp.
- Locators - Fixed component of a fixture. It is used to

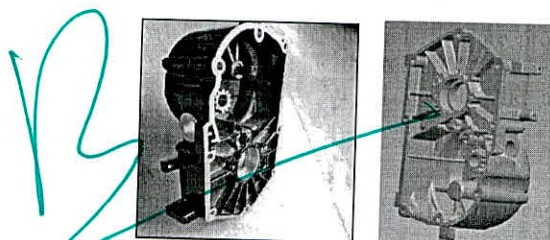
establish and maintain the position of a part in the fixture by constraining the movement of the part. For work-pieces of greater variability in shapes and surface conditions, a locator can also be adjustable.

- Supports – These are the elements that are provided on the fixture body to provide the required force against the deformation which are caused due to the action of clamping.

2. Fixture Design Steps

- Dimensional analysis of the Casted Gear Cover Component.
- Modelling of the component in 2D and 3D.
- Analysis of the time and cost of old 3 Fixtures that were used for machining earlier.
- Concept designing of the new fixture considering Design specification, Factory requirements, economy, ease of use and safety.
- Stress and deformation analysis using ASYSIS R16.2 Version.
- Final design and production.

2.1 Casted Gear Cover Component Design



Wear and Impact Characterization of A356.1 Aluminium Alloy Reinforced with Magnesium Nano Particle

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Abstract - Aluminum matrix composites (AMCs) reinforced with Nano-sized Magnesium particles are widely used for high performance applications such as automotive, military, and aerospace and electricity industries because of their improved physical and mechanical properties. In this research, Magnesium Oxide (MgO) Nano particles were synthesized by Solution Combustion Synthesis process. Prepared Nano particles were characterized by Powder X-ray diffraction (PXRD). A356.1 Aluminium alloy was successfully reinforced with a variation of 0.25 0.5, 0.75 and 1.0 Wt.% of the Synthesized Magnesium Oxide Nanoparticle, via stir casting Technique at a temperature of 800°C. Prepared composites were then characterized by scanning electron microscopy (SEM). Wear tests were carried out at Varying Wt. % ratios with varying Conditions of Speed, Load and Time. The results reveal that the Nano Metal Matrix Composite (NMMC)'s containing 1.0 Wt.% reinforcement particle has shown improved mechanical properties.

Keywords— Nano Metal Matrix Composite, Magnesium Nano A356.1 aluminium alloy, Stir casting

INTRODUCTION

The aluminum-based metal matrix composites (AMCs) have a high potential for advanced applications when high specific strength and modulus as well as good wear resistance are important [1,2]. The properties of the composites are influenced by the chemical nature of the components, morphology of particles, their spatial distribution and interface interaction. The high volume fraction of fine and thermally stable reinforcement yields good mechanical properties of the composite [3]. Development of new structural materials with higher strength to-weight ratios is one of the biggest challenges in transportation industry to reduce fuel consumption and to reduce greenhouse gas emissions [4–10]. Accordingly, close attention is paid to light metals and alloys such as magnesium, due to its intrinsic characteristics of low density, good machine ability and availability in the global market [5]. However, the relatively low strength, poor room temperature ductility and toughness limit the range of magnesium applications. Alloying with Al, Zn, Mn, Ca and other elements is a conventional way to improve properties of magnesium. The enhancement in mechanical properties of the obtained alloys, however, might not be as high as those obtained by composite reinforcements [5]. Since composite materials have several advantages over pure

metals and alloys, numerous studies have been conducted on the addition of discontinuous particles in micron- to Nano-scale and their effects on the achieved properties during the last two decades. Selection of reinforcements is typically governed by cost, availability and compatibility with matrix. Most research studies have investigated the properties of magnesium composites containing different hard ceramic nanoparticles.

Aluminium based metal matrix composites (NMMCs) have been extensively studied as an attractive choice for aerospace and automotive applications due to their low density and superior specific properties including strength, stiffness and creep resistance [1–13]. To fabricate aluminium based NMMCs, Nano sized magnesium particle used. As compared to the unreinforced aluminium alloy matrix, Magnesium reinforced aluminium NMMCs have a considerably improved strength, but also a significantly reduced ductility. Nano particle reinforcements can significantly increase the matrix mechanical strength by more effectively promoting particle hardening mechanisms than micron size particles. Solidification processing such as stir casting that utilizes mechanical stirring is a widely used technique of producing aluminium matrix composites that are reinforced by Nano sized magnesium particles. A combination of good distribution and dispersion of Nano particles can be achieved by mechanical stirring.

In the present work, we attempted to synthesis magnesium Nano particle using combustion synthesis method and to fabricate aluminum alloy Nano metal matrix composite with different volume fractions of Nano magnesium particles using stir casting technique. The aim has been to study the effect of Nano reinforcement in to A356.1 aluminium alloy and characterization of the NMMCs.

Experimental procedure

Preparation of magnesium Nano particle

Table 1. A356.1 Aluminium alloy composition

Elements	Al	Si	Fe	Cu	Mg	Mn	Zn	Ni
Wt. %	91.73	7.23	0.32	0.18	0.38	0.02	0.05	0.05

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Mechanical Properties of Sisal Fiber Reinforced Thermoplastic Starch Bio-Composites

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Abstract

Natural fiber reinforced starch based composites are processed by compression molding technique. Corn starch is used as matrix. 65% w/w Sisal fiber were used in preparing the composites. Glycerol and water are used plasticizers. Mechanical properties like ultimate tensile strength and impact strength were found. In both cases, improved mechanical properties are obtained at increasing fiber contents. Tensile strength look noticeably improved with the addition of 10% by weight of sisal fibers, while the results for impact strength obtained for sisal fibers are fall apart.

Keywords: Compression molding, starch polymers, natural fiber composites.

INTRODUCTION

Bio degradable Composites were produced from natural resources. Many of the researchers all over the world developing green composites as a alternative to the petroleum based materials which causing environmental problems. The present study is the first of an arrangement that report information for the portrayal of starch-natural fiber composites delivered from a wide assortment of local starch grids and normal filament sisal, while utilizing distinctive plasticizers, and is concerned principally with the investigation of the preparing techniques and the portrayal of the mechanical properties of the bio-composites.

Starch are produced from plant extract, many parts of the world starch were used as food. It consists of amylase and amylopectin, and glucose [4]. Despite the fact that starch granules are totally insoluble in frosty water, they change physically when

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A Review about Scope of Traditional Medicinal Plants in a New Drug Discovery

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Abstract

'AYUSH' is the most important traditional system of medicine, which has been practised since thousands of long years by our ancestors. AYUSH has a very good healing power for so many problems by using both traditional and natural medicine. The new drug discovery is taking long time to produce its products and thus there is a reduction in number of new drug approvals due to different issues like legal problems or additional effects or the end result and its costs are also very high compared with AYUSH medicines. On doing bio-assay to the identified plant, it may lead to the isolation of a druggable compound called new drug. The success rate is more in herbal medicine than the drug that is chemically synthesized and economically friendly in nature. Mother Nature has an abundant wealth of medicinal plants. About 50% of all modern drugs consist of derivatives of natural products which are derived from medicinal plants. So, since in the recent year's development, the drug discovery from plant source is more focused than the drugs synthesized chemically. Medicinal plants are highly valued as a source of molecule for therapeutics. The medicinal plant drugs can also act on pharmacological targets like cancer, malaria, HIV and so many harmful diseases to the mankind. The methods used to extract the new drugs from different medicinal plants are proved to be the best successful approaches to discover the new medicinal plants.

Keywords: AYUSH, medicinal plants, drug discovery, bio-assay, therapeutics, pharmacological targets, herbs

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INTRODUCTION

Nature is the best example for the phenomenon of symbiosis. The natural product from plants and animals are used as the basis for the treatment of diseases. India has a rich heritage of traditional system of medicine which is very well documented. India has a rich culture of medicinal herbs and spices. There are more than 2000 species with high potential ability for AYUSH medicines. Since most of the people in popular countries cannot afford pharmaceutical products they rely on Ayurveda medicines as they are cheaper and safer [1].

The term medicinal plants, includes various types of plants which are used in herbal medicine. It is the use of plants for medicinal purposes and the study of such uses. Traditional plant medicines continue to be widely used on many purposes like rise in population, inadequate supply of drugs, high cost of treatment, side effects and

development of resistance to currently used drugs for infectious diseases have led to increased emphasis on the use of medicinal plants as a source of medicine for a wide variety of human ailments.

In India, we have large amount of forest land which is a reservoir for many medicinal and aromatic plants, which are mainly used as a source of raw materials for drug manufacturing and perfume products. About 8000 herbal products are currently present in AYUSH systems in India [2, 3].

Recently WHO estimated that 80% of people use herbal medicines for their primary health care and about 21000 plant species have the potent to be used as a medicinal plant. Over the past two decades, there has been a tremendous increase in use of medicinal plants because they are very significant and there is also a lack of research data in this field [2].

Mechanical Properties of Sisal Fiber Reinforced Thermoplastic Starch Bio-Composites

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Evaluation of Performance And Emission Characteristics Of Biodiesel Derived from Dairy Scum oil on a Computerized C.I Engine

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Abstract

The potential of using dairy waste scum as a feed stock for bio-diesel production was investigated. Experiments carried out by using dairy waste scum as the raw material to produce biodiesel by using transesterification process. The various properties such as flash point pour point calorific value kinematic viscosity compared with ASTM biodiesel standards. Experiments conducted using the fuel blends of B10, B30, B40, B60, and B80 and for 100% diesel and 100% bio-diesel and its comparison of brake thermal efficiency, brake power and brake specific fuel consumption for the various blends were made with diesel with an engine speed of 1500rpm. Present study shows that B40 blend of dairy scum oil have a better performance characteristics compared to diesel oil and better emission characteristics of blend B10 compared to diesel oil. The present analysis confirms that bio-diesel from dairy waste scum is quite suitable as an alternative to petroleum diesel. This new way for using dairy waste scum reduces the cost of production of bio-diesel and the problem related to the disposal of Dairy scum.

Keywords: Dairy scum oil, Biodiesel, Transesterification

1 Introduction:

Biodiesel as an alternative fuel for diesel engines is becoming increasingly important due to diminishing petroleum reserves and the environmental consequences of exhaust gases from petroleum-fuelled engines. As a future prospective fuel, biodiesel has to compete economically with petroleum diesel fuels. The availability and sustainability of sufficient supplies of less expensive feedstock will be a crucial determinant delivering a competitive biodiesel to the

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2-(5-Methyl-1-benzofuran-3-yl)-N-(2-phenylethyl)-acetamide

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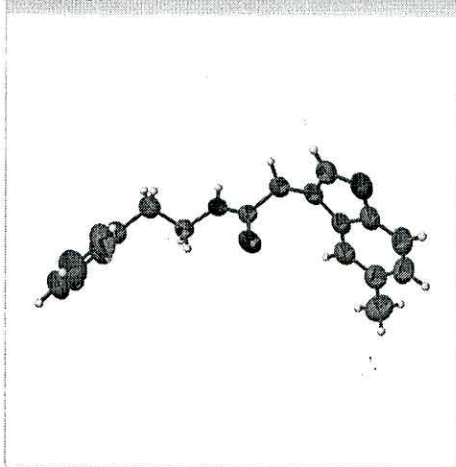
Keywords: crystal structure; benzofuran; hydrogen bonding; π - π stacking.

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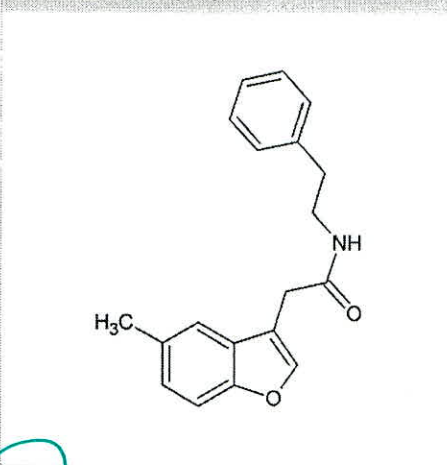
Structural data: full structural data are available from iucrdata.iucr.org

The title compound, C₁₉H₁₉NO₂, is non-planar with the phenyl ring of the phenethylacetamide residue inclined to the benzofuran ring system by 84.8 (3)°. The methyl group lies in the plane of the fused ring system [C—C—C torsion angle = −179.6 (3)°]. In the crystal, N—H...O hydrogen bonds link the molecules into chains along the *a*-axis direction. π - π stacking interactions with a centroid-to-centroid distances of 3.497 (3) Å further stabilize the structure, stacking the molecules along *a*.

3D view



Chemical scheme



Structure description

Benzofuran derivatives with an amide linkage have attracted attention due to their wide range of biological activities. These include acting as melatonin receptor selective ligands (Wallez *et al.*, 2002), glycogen synthase kinase 3 β inhibitors, which suppress proliferation and survival of pancreatic cancer cells (Gaisina *et al.*, 2009), and ischemic cell death inhibitors (Suh *et al.*, 2010). They are also used as antitubercular and antifungal (Telvekar *et al.*, 2012) or anticonvulsant agents (Shakya *et al.*, 2016). They inhibit monoamine oxidase (Pisani *et al.*, 2013), the hepatitis C virus (Bowman *et al.*, 2015) and NF- κ B activity (Choi *et al.*, 2016). Other pharmaceutical applications include the treatment of cognitive disorders (Mazurov *et al.*, 2012) and as anti-oestrogen breast cancer agents (Li *et al.*, 2013). Chemically they are used as intermediates for the synthesis of morphine alkaloids (France *et al.*, 2008).

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