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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISS N	Index
Impact of AlInN Back-Barrier Over AlGaIn/GaN MOS-HEMT With HfO ₂ Dielectric Using Cubic Spline Interpolation Technique	Prajoon P	ECE	IEEE Transaction on Electron Devices	2019-2020	0018-9383	Web of Science

The screenshot shows the IEEE Xplore journal page for 'IEEE TRANSACTIONS ON ELECTRON DEVICES'. It includes a search bar, a list of search results, and a 'General Information' section. The search results table shows the following details:

Publication Vehicle	Effective Date	Vol/No/Published	ISSN
IEEE Transactions on Electron Devices	1978	66/1/1	0018-9383

The 'General Information' section includes details about the journal's ISSN, volume, and issue information.

The cover page of the IEEE Transaction on Electron Devices journal features the title 'Impact of AlInN Back-Barrier Over AlGaIn/GaN MOS-HEMT With HfO₂ Dielectric Using Cubic Spline Interpolation Technique'. The authors listed are V. Sandeep, Graduate Student Member, IEEE; J. Charles Pravin, Member, IEEE; A. Ramesh Babu, and P. Prajoon, Member, IEEE.

The abstract states: "The characteristics of AlInN/gallium nitride (GaN) metal-oxide-semiconductor high electron mobility transistors (MOS-HEMT) with an AlInN back-barrier layer has been studied here. An analytical model is proposed for calculating the charge density (n_{ch}), carrier concentration (n_{ch}), drain current (I_d), and transconductance (g_m) of the device by incorporating HfO₂ dielectric as a high- ϵ dielectric layer. The charges created between the oxide and the AlInN barrier layer influence the enhancement of carrier concentration of up to 8.2×10^{17} cm⁻³ at the two-dimensional electron gas (2DEG). The AlInN back-barrier increases the conduction band (CB) level of the GaN buffer and eliminates the confinement problems near the channel. By deriving the mathematical dependence of these parameters, the device demonstrated a positive threshold shift and a high current drive of 880 mA/mm. Cubic spline interpolation (CSI) technique is employed here to model the parameters in a more precise manner. The outcomes are evidence that the device could be a potential solution for high power switching as well as microwave applications."

The introduction discusses the challenges of AlInN-based HEMTs and the proposed solution using a back-barrier layer and HfO₂ dielectric. It highlights the benefits of the proposed device, such as improved carrier concentration and reduced confinement problems.

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
A Numerical Investigation of Heat Suppression in HEMT for Power Electronics Application	Prajoon P	ECE	Silicon	2019-2020	1876-9918	Web of Science

The screenshot shows the journal's website interface. At the top, there's a navigation bar with 'Web of Science Group' and 'Master Journal List'. Below that, the journal name 'SILICON' is prominently displayed. A sidebar on the left contains 'General Information' and 'Web of Science Coverage'. The main content area shows 'General Information' with fields for 'Journal Website', 'ISSN', 'Publisher Website', 'First Published', 'Issues Per Year', 'Primary Language', 'Check for updates', 'Check for updates', 'Check for updates', and 'Check for updates'. At the bottom, there are 'Collection', 'Index', 'Category', and 'Similar Journals' links.

The screenshot shows the abstract page of the paper. At the top, it says 'Silicon' and provides the URL 'https://doi.org/10.1007/s11634-020-00434-1'. Below that, it says 'ORIGINAL PAPER'. The title of the paper is 'A Numerical Investigation of Heat Suppression in HEMT for Power Electronics Application'. The authors listed are 'L. Arivazhagan¹ · D. Nirmal² · P. Pavan Kumar Reddy¹ · J. Ajayan³ · D. Godfrey¹ · P. Prajoon⁴ · Ashok Ray⁴'. The date is 'Received: 2 June 2020 / Accepted: 10 August 2020'. The abstract text describes the proposed AlGaN/GaN High Electron Mobility Transistor (HEMT) with stacked passivation (Diamond/SiN) and its performance improvements. The keywords are 'GaN - HEMT - Self-heating - Diamond - Thermal resistance'. The introduction section discusses the challenges of AlGaN/GaN HEMT in power applications and the proposed solution of stacked passivation. The authors' affiliations are listed at the bottom.

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Optical Grating Techniques for MEMS based Spectrometer - A Review	Prajoon P	ECE	IEEE Sensors Council	2019-2020	1558-1748	Web of Science

http://arxiv.org/journal-profile

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IEEE SENSORS JOURNAL Show This Journal

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1558-1748, ISSN 1558-1748, ISSN 1748

Journal Citation Report

Peer-Reviewed Information

Published Information

Journal Website: [IEEE SENSORS JOURNAL](#)

First Published: 2011

Issues Per Year: 24

Primary Language: English

Country/Region: UNITED STATES OF AMERICA

Web of Science Coverage

IEEE SENSORS JOURNAL, VOL. 19

Optical Grating Techniques for MEMS based Spectrometer - A Review

Ajith Ravindran, Senior Member, IEEE, D Nirmal, Senior Member, IEEE and Prajoon P and Gracia Nirmala Rani D

Abstract—This paper summarizes the innovations of the spectrometers for the measurement of consistency based parameters of the handheld Micro Electro Mechanical System (MEMS) Spectrometer. Few, highly sensitive, miniature spectroscopy techniques empowered quick, easy and effective measures for various applications in the light spectroscopy-based identification and quantification, advances in the field of wavelength characterization are significant and essential. The identification of grid parameters and linking conditions are necessary for the design and fabrication of diffraction gratings for the spectrometer. This work analyzes the emerging trends in Micro-Spectrometer's Grating Technique, focusing on the aspects of grating parameters and the newer developments of grating. The main parameters for evaluating the performance of a grating have been reviewed and found that grating efficiency, groove density, free spectral range and resolving power play a significant part in the grating performance. The fabrication techniques employed as well as the materials used in the fabrication process, play a significant role in the efficiency of the grating. Silicon, Silicon dioxide (SiO₂), Glass (Silica glass), Poly methyl methacrylate (PMMA), Chromium and Silicon nitride (Si₃N₄) are the most used materials. The integration of new materials may be ideal for the state-of-the-art semiconductor industry techniques for MEMS fabrication along with a new linking structure would increase the efficiency of the grating.

Index Terms—Diffraction, Optical Grating, Spectroscopy, System Reaction, MEMS, Spectral Range, Dispersion, Transmission gratings, Diffraction order, Groove density.

1. INTRODUCTION

SPECTROSCOPY can be defined as the analysis of absorption, transmission and reflection spectra, and the relation to the radiation wavelength [1]. The spectrum of the material components are derived from a unique interaction of the material's components with specific electromagnetic wave frequencies (absorption, transmission or reflection) [2]. The spectrum of the specific materials will be the graphical representation of the resulting interaction with frequency. Today, almost all the technical areas of science and engineering are spectroscopic techniques. The variation between the different scientific field may be observed by means of a comparative study of the electromagnetic spectra of various materials with properties comparable to equal size [3, 4].

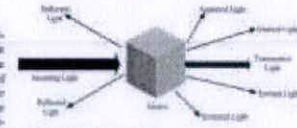


Fig. 1. Beer-Spectrometry Theory

The incident diagram of the block demonstrating the spectroscopy theory is depicted in Fig. 1. The relations between the elements in a radiative and electromagnetic radiation clearly the constituents of the materials in radiative, absorptive, superconductive and insulative. This is, information of the material such as its atoms, molecules, crystal, etc. can be easily obtained from the electromagnetic wave generation process and its source [5]-[7].

Absorption is electromagnetic energy transfer from the radiation to atoms or molecules in the sample used in the analysis. As a consequence of interaction of the radiation with a sample in a solid, liquid or gas state, the electrons that are in the ground state relax and give to an energy state which will be at a lower level by photon emission and the energy of the emitted photon will be similar to the gap in energy between states. Radiation may be emitted from the surface of the sample because of its physical characteristics. If the matter is transparent, light will pass through it. When a photon strikes the external layer of an atom, the electron is only absorbed if the amount of energy it carries, kicks the electron from one energy level to higher levels. The photon energies that are not absorbed in the spectrum are the ones that have equal energy between two energy levels. Spectroscopic analysis are the only

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Investigation on the performance of fiber reinforced concrete subjected to standard fire exposure	Alwyn Varghes e	CE	World Journal of Engineering	2019-2020	1708-5284	Web of Science

The screenshot shows the journal's website interface. At the top, it says 'WORLD JOURNAL OF ENGINEERING'. Below that, the article title 'Investigation on the performance of fiber reinforced concrete subjected to standard fire exposure' is visible, along with the author's name 'Alwyn Varghes e'. There is also a 'RETURN TO SEARCH RESULTS' button.

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Investigation on the performance of fiber reinforced concrete subjected to standard fire exposure

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 Department of Civil Engineering, Karunya University, Coimbatore, India, and
 Dhana Anandhathi and Praveen Aravind
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Abstract
 Purpose - Aim of this research article is to examine the stress-strain behavior and modulus of elasticity of fiber-reinforced concrete (FRC) exposed to elevated temperature. The purpose of this paper is to study the effect of standard fire exposure on the mechanical and microstructural characteristics of concrete specimens with different strength grade.
 Design/methodology/approach - An electrical basic health furnace was developed to simulate the ISO 834 standard fire curve. Specimens were exposed to high temperature of 401°C, 425°C and 450°C for the duration of 30, 60 and 90 min, respectively, as per standard fire curve. Peak stress, peak strain, modulus of elasticity and damage level of tested concrete specimens were analyzed by experimental investigation. SEM based microstructure investigation has been carried out to analyze the microstructural characteristics of tested concrete specimens.
 Findings - The results revealed that carbon fiber reinforced concrete was found to be better than the FRC made with other fibers on improving the modulus of elasticity of concrete. An empirical relationship has been established to predict the modulus of elasticity of temperature exposed specimens with different type of fiber and grade of concrete. In comparison with low swelling poly fibers, high swelling poly fibers exhibited higher modulus of elasticity under elevated conditions. Surface damage and porosity level of concrete with carbon and basalt fiber were found to be lower than other FRC.
 Originality/value - Empirical relationship was developed to determine the modulus of elasticity of concrete exposed to elevated temperature, and this will be useful for concrete design applications. This research work may be useful for finding the residual temperature strength of concrete exposed to elevated temperature. So that it will be helpful to identify the suitable temperature strength for reinforced concrete elements.

Keywords Fiber reinforced concrete; Modulus of elasticity; Basalt fiber; Carbon fiber; Glass fiber; Polypropylene fiber

Paper type Research paper

1. Introduction
 Concrete is a versatile building material used in the construction of buildings and structures compared to the other building materials. Concrete structures always provide a reasonably good fire span with least maintenance and hence it is the most widely used material than other materials (Khanlou, 2005). The excellent fire resistance property of concrete is because of its impurities like aggregates and cement. The properties which enable the concrete to resist fire are mainly its low thermal conductivity and high specific heat capacity. Concrete protects steel reinforcement elements from combustion by acting as a fire shield among its adjacent space (Winkler, 2011). In the case of exposure to higher temperatures for a longer period of time, concrete undergoes thermo-chemical and physical changes which lead to weakening of concrete (Hikal, 2000; Xu et al., 2001). The type of aggregate and its proportion have a significant role on the residual characteristics of concrete exposed to high temperature (Arin, 2007). The degradation of concrete with different aggregates are not similar when exposed to elevated heat (Sari and H-Rahim, 2016). Fibers have been widely used to improve the ductility of concrete. It is reported in literature that some fibers help to maintain the proportion of concrete after exposure to elevated temperature. The addition of fiber was found to improve the behavior of concrete at elevated temperature and the fiber was found to enhance the peak stress of concrete (Poon et al., 2006). Table 1 gives a brief summary of the research work carried out on modulus of fiber-reinforced concrete (FRC) exposed to elevated temperature.
 Although few researchers have reported about the modulus of elasticity of different FRC (except for concrete with steel fiber, polypropylene fiber (PPF) and poly vinyl alcohol fiber

The current research has been published in the journal available in Emerald Insight at <https://www.emerald.com/insight/1761-5284.htm>

Department of Science and Technology, Ministry of Science and Technology, Science and Engineering Research Board, YSR (19/10/2016)

Received 28 April 2019
 Revised 20 September 2019
 Accepted 3 December 2019

Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Estimation of fuel properties and characterization of hemp biodiesel using spectrometric techniques	Cijil B John, B. Deepanraj	ME	Energy Sources, Part A: Recovery, Utilization, and Environmental Effects	2019-2020	1556-7036	Web of Science

The screenshot shows the journal's website interface. At the top, there is a navigation bar with options like 'Home', 'About Us', 'Contact Us', etc. Below that, the article title 'ENERGY SOURCES PART A-RECOVERY UTILIZATION AND ENVIRONMENTAL EFFECTS' is displayed. A table provides general information about the journal, including its ISSN (1556-7036), frequency (Quarterly), and publisher details.

Journal Details	ISSN	Publisher Details	ISSN
ISSN	1556-7036	Frequency	Quarterly
ISSN (Print)	1556-7036	Country / Region	USA
Printed Language	English		

Estimation of fuel properties and characterization of hemp biodiesel using spectrometric techniques

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ABSTRACT
 Reducing fossil fuel reliance is considered a great challenge for several progressive emerging economies. The development of alternative renewable fuels tends to improve energy security as well as diminish fuel supply vulnerability. This paper details an enhanced protocol intended for the manufacture of hemp biodiesel over two-stage base catalyzed transesterification from crude hemp oil (CHO). The estimation of fuel properties, along with the various spectrometric techniques like Gas Chromatography and Mass Spectrometry (GC-MS), Fourier Transform Infra-Red Spectrometry (FTIR), and Thermo Gravimetry-Differential Scanning Calorimetry/Derivative Thermogravimetry (TG-DSC/DTG) methodologies were used to properly assess the quality and quantity of hemp (Cannabis Sativa L.) biodiesel (HB). The density, kinematic viscosity, and cetane number of HB were found to be 870 kg/m³, 3.81 cSt, and 50, respectively. Since the estimated fuel properties fall well within the range of American Society for Testing and Materials (ASTM) standards, HB could be considered as a sustainable fuel alternative to conventional diesel. GC-MS results demonstrate that the HB contains unaturated long-chain fatty acids like 9,15-Octadecadienoic acid methyl ester as dominant in the mixture. The FTIR spectrum of crude hemp oil and the synthesized biodiesel confirm the conversion of triglycerides in the CHO into methyl esters in the HB. The findings obtained from TG-DSC/DTG are in near agreement with the results of GC-MS and FTIR. It is therefore proven the hemp oil has abundant potential to be used as an inedible source for the manufacture of bio diesel.

ARTICLE HISTORY
 Received 28 June 2020
 Revised 14 October 2020
 Accepted 16 October 2020

KEYWORDS
 Hemp biodiesel; fatty acid methyl ester; fuel properties; biodiesel characterization; spectrometric techniques

Introduction

Reliable, affordable, safe, and eco-friendly energy supplies are essential for the economic development of a nation, as well as for the overall well-being of an individual. A major share of the global energy demand is being met by fossil fuels like coal, natural gas, and other petroleum products. Compression Ignition (C.I) engines fueled by petro-diesel, are widely used in industrial, agricultural, and transportation sectors due to their versatility in terms of greater fuel efficiency, reliability, lower fuel costs, and safer operation. Researchers have been successful in raising the thermal efficiency of C.I engines considerably in the past. At the same time, the pollutants generated by the combustion of fossil fuels are responsible for the rising environmental concerns like global warming, climatic change, acid rain, respiratory problems to individuals, etc. The ever-increasing population, the higher living standards caused by rapid urbanization and industrialization, dependence on foreign countries for crude oil, the rapid hike in petroleum prices, and the environmental pollution problems caused by the

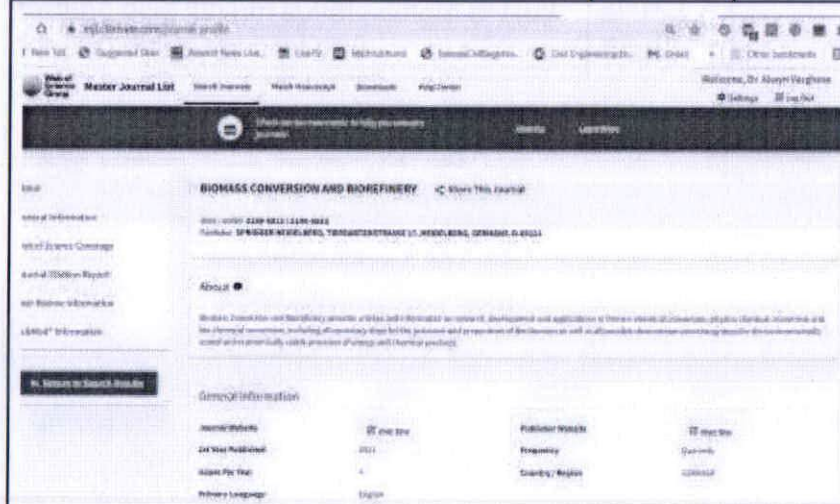
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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Palm stearin biodiesel: preparation, characterization using spectrometric techniques and the assessment of fuel properties	Cijil B John, B. Deepanraj	ME	Biomass Conversion and Biorefinery	2019-2020	2190-6823	Web of Science



Biomass Conversion and Biorefinery
<https://doi.org/10.1007/s13399-020-01265-0>

ORIGINAL ARTICLE

Palm stearin biodiesel: preparation, characterization using spectrometric techniques and the assessment of fuel properties

Cijil B. John^{1,2} · S. Antony Raja¹ · B. Deepanraj² · H. C. Ong³

Received: 11 October 2020 / Revised: 16 December 2020 / Accepted: 29 December 2020
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Abstract

In the contemporary era, our planet has been experiencing an unprecedented energy shortage and degradation of the environment. The exhaustion of crude oil reserves, fluctuation in fuel prices, and the escalating environmental pollution problems are driving the researchers worldwide to search for sustainable alternative fuels. This study discusses an enhanced protocol for the production of biodiesel using crude palm stearin (CPS), the nonoilable solid portion of palm oil, through alkali-catalyzed transesterification. The significant physicochemical properties of CPS and palm stearin biodiesel (PSB) were analyzed by adopting American Society for Testing and Materials (ASTM) test procedures and contrasted with the commonly used biodiesels, petro-diesel, and ASTM biodiesel standards. The kinematic viscosity, density, gross calorific value, and cetane number of PSB were noticed to be 0.566 cSt, 0.882 kg m⁻³, 38,676.99 kJ/kg, and 47.5, respectively. The fatty acid composition and the functional groups present in CPS and PSB were determined by gas chromatography/mass spectrometry (GCMS) and Fourier transform infrared spectrometry (FTIR) techniques. GCMS spectra for PSB demonstrated a composition consisting of myristic acid, palmitoleic acid, palmitic acid, elaidic acid, oleic acid, stearic acid, linoleic acid, and eicosapentaenoic acid in varying percentages. The conversion of triglycerides in the CPS into methyl esters in PSB was confirmed by the FTIR analysis. The results of thermogravimetric analyses were also in good agreement with GCMS and FTIR. The closeness of the estimated properties of PSB with petro-diesel and the conformance with ASTM standards indicate the prospective of PSB as an alternative fuel for compressed ignition engines.

Keywords Palm stearin biodiesel · Biodiesel characterization · Alternative fuel · Fatty acid composition · Spectrometric techniques · Thermogravimetric analysis

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Growth and investigations of 3rd order NLO properties of novel semi organic tartaric acid lithium sulfate single crystal for photonics application	B. Deepanraj, P. L. Biju	ME	Optical and Quantum Electronics	2019-2020	1572-817X	Web of Science

The screenshot shows the journal's website interface. At the top, there is a navigation bar with options like 'Home', 'About Us', 'Contact Us', etc. Below that, the journal title 'OPTICAL AND QUANTUM ELECTRONICS' is displayed. The article title 'Growth and investigations of 3rd order NLO properties of novel semi organic tartaric acid lithium sulfate single crystal for photonics application' is visible. There is also a 'General Information' section with fields for 'Journal Volume', 'Issue Number', 'Year of Publication', and 'Page Number'. A 'Download Full Text' button is present.

Growth and investigations of 3rd order NLO properties of novel semi organic tartaric acid lithium sulfate single crystal for photonics application

S. Rojeswari¹ · Geetha Palani¹ · B. Deepanraj² · P. L. Biju² · V. Chithambaram¹

Received: 17 March 2020 / Accepted: 15 July 2020

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Abstract

Single crystals of tartaric acid lithium sulfate (TALS), a semi-organic nonlinear optical crystal has been successfully grown by slow evaporation solution growth technique. Single crystals were grown in a life span of 3 weeks. The grown crystals were characterized by single crystal X-ray diffraction to identify the lattice parameters. Fourier Transform Infra Red studies confirm the presence of various functional groups present in the crystal. Optical, mechanical, microscopic image and thermal stabilities of the title crystal was carried out to know the properties of the titled compound. Third order non-linear studies have also been studied by Z-scan techniques. Nonlinear absorption and nonlinear refractive index were found out and the third order bulk susceptibility of compound was also estimated. The negative sign in the refractive index indicates the self-defocusing nature of the crystal.

Keywords Semi organic crystal · Optical properties · DSC analysis · Mechanical properties · Z-scan technique

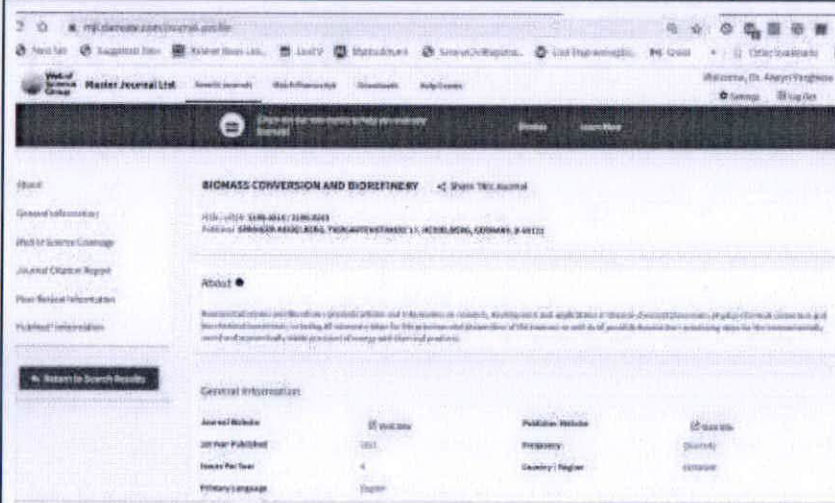
1 Outline

Recently, many young researchers are focusing their interest towards the development of third order semi organic nonlinear optical crystal. Because of its wide application in the field of LASER, photo detectors, computers, optical calculators, signal processing, etc. (Terkla-Derdra et al. 2000; Fuks-Janczarek et al. 2005; Zawadzka et al. 2013). The emerging materials must possess shorter UV cutoff wavelength, large optical trans-

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Thematic issue: energy provision from organic by-products, residues, and wastes in Asia	B. Deepanraj	ME	Biomass Conversion and Biorefinery	2019-2020	2190-6823	Web of Science



Biomass Conversion and Biorefinery
<https://doi.org/10.1007/s13399-020-00506-8>

EDITORIAL



Thematic issue: energy provision from organic by-products, residues, and wastes in Asia

B. Deepanraj¹ · M. Mubarak² · S. Jayaraj³ · R. Thundil Karuppa Raj⁴

¹ Springer-Verlag GmbH Germany, part of Springer Nature 2020

Due to fast industrialization and increasing population, large quantities of organic wastes are being generated in different forms such as solids, liquids, sludge, and gases. These wastes include among others agricultural wastes and crop residues, excreta from animals, slaughterhouse waste, organic household waste, polluted waste water, wood processing residues, and waste from fruit markets. Each city produces tons of organic wastes daily from households, hospitals, industry offices, market centers, restaurants, etc. Every year in the world, several million tons of organic wastes are being disposed through different ways such as incineration, anaerobic digestion, land applications, and land filling.

This globally available and to be treated organic waste has a high potential to be used as a bio-renewable energy resource and to be turned into high-value by-products. This thematic issue titled "Energy provision from organic by-products, residues and wastes in Asia" within the *Biomass Conversion and Biorefinery* (Journal) highlights recent advances of our understanding on energy production from different waste streams in Asia.

The above thematic issue consists of state-of-the-art and original research works involving experimental and numerical studies, recent developments, and novel and emerging

technologies in the area of energy production from organic waste. This thematic issue covers the thermo-chemical and biochemical conversion systems including gasification of palm kernel shells, groundnut shell, and *Madinia longifolia* biomass to bioenergy. Additionally, saccharification of lignocellulosic biomass for bioethanol production, utilization of waste coconut meal for biodiesel and bioethanol production, and usage of beef tallow for biodiesel are tackled. Beside this, anaerobic digestion of perennial grass, textile industries wastes, food waste, and water hyacinth for biogas (biomethane) production have been addressed. We believe that the readers will enjoy reading the scientific articles and will collect many new scientific impressions and insights from this thematic issue.

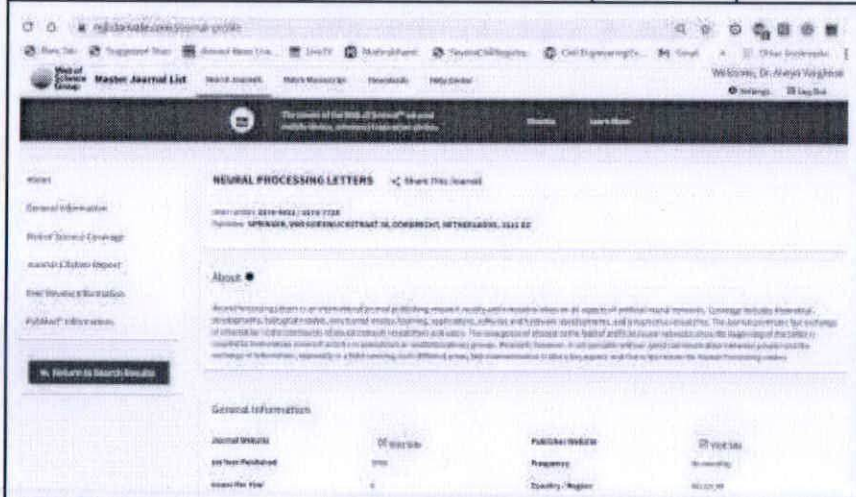
Finally, we would like to thank the authors of this thematic issue for their valuable contributions and all the reviewers for their helpful comments and suggestions greatly helping to enhance the quality of the papers.

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Super-Resolution Based Automatic Diagnosis of Retinal Disease Detection for Clinical Application	Anoop V	ECE	Neural Processing Letters, Springer	2019-2020	1573-773X	Web of Science



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Super-Resolution Based Automatic Diagnosis of Retinal Disease Detection for Clinical Applications

V. Anoop¹ · P. R. Bin²

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Abstract

In medical image processing, the automatic analysis of pathology localization and the anatomical segmentation steps are more important. The Fundus images of Low resolution (LR) are not applicable to detect the retinal disease. The main aim of this paper is to enhance the resolution of the low-resolution retinal images obtained from the cheap imaging devices within less computational time and high accuracy. So, we proposed the fundus image with Super-Resolution and its performance via the Diagnostically Significant Area (DSA). This approach focuses only on the region of Interest (ROI) instead of concentrating on the entire image leading to less computational time by reducing the time complexity. Therefore, the Eigen MR inter-band feature, Energy MR intra-band feature, Shannon entropy and Sensitive Contrast Interest (SCI) are used to capture the clinical data from the selected region. Therefore, the DSA is determined by using Levenshtein based KNN classifier. Because of better classification outcomes, the Bicubic method is employed in the selected region to reduce the loss of reconstruction error. Experimentally, the implementation works are carried out in the platform of MATLAB with DRIVE and STARE database images are chosen. The super-resolution image performances are compared with different start of art techniques such as PSM, GR-SR, LLE, and SpC-SR. Finally, higher efficiency with low computational super-resolution fundus images is collected.

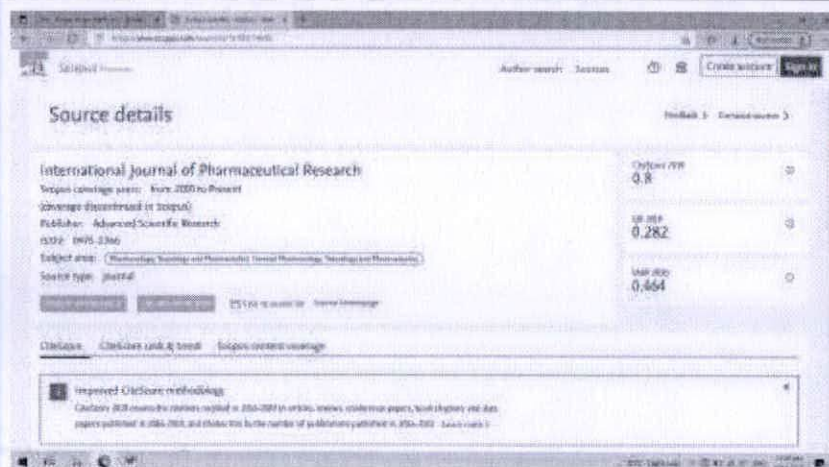
Keywords Retinal image · Super-resolution · ROI · Fundus · KNN

1 Introduction

The degeneration of age-related muscular, Diabetic Retinopathy (DR) disease and the retinal problem diagnosis are carried out by using Fluorescein Angiographic (FA). In the diabetic population, the main reason for the blindness and low vision is Diabetic Macular Edema (DME). When compared to Proliferative diabetic retinopathy, the DME contains more visual loss. For ophthalmologists, the diagnosis and prediction of various eye diseases from the muscular area is an important task [1]. Hence, progressive disease is

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
CAD Systems for Automatic Detection and Classification of Covid-19 in Nano CT Lung Image by Using Machine Learning Technique	Jarin T	EEE	International Journal of Pharmaceutical Research	2019-2020	0975-2366	Scopus



Article Detail

CAD Systems for Automatic Detection and Classification of Covid-19 in Nano CT Lung Image by Using Machine Learning Technique

Author: S.U. ASWATHY, T. JARIN, RIA MATHEWS, LAKSHMI M NAIR, M. RROAN

Abstract: The WHO has declared Human Coronavirus (HCoV) ongoing outbreak to be a global public health emergency. Corona virus (HCoV) was reported two months ago in Wuhan, China. Health care systems over the world get into a chaotic mode due to limited capacity and a hectic increase of suspected coronavirus cases. The one thing that everybody is trying to do is to reduce the effect of cause created for a patient. This study will show how Machine Learning technique can be used for classifying the infected and healthy lung using the nano scaling imaging technique of computed tomography (CT) lung scans. Pre-processing is used to reduce the effect of intensity variations and for noise removal between CT slices. Then thresholding and other morphological operation is used to separately isolate the background of the CT lung scan. Each dataset that we take undergoes a texture-based feature extraction method in which it uses GLCM along with a wrapper method for optimization. The obtained features are classified using a Deep convolutional neural network, which will classify in several layers. By giving our input of scan images it will train in an efficient manner and gives us an accuracy of 99%.

Keyword: Nano Technique, GLCM, Deep Convolutional Neural Network, COVID-19, Pneumonia.

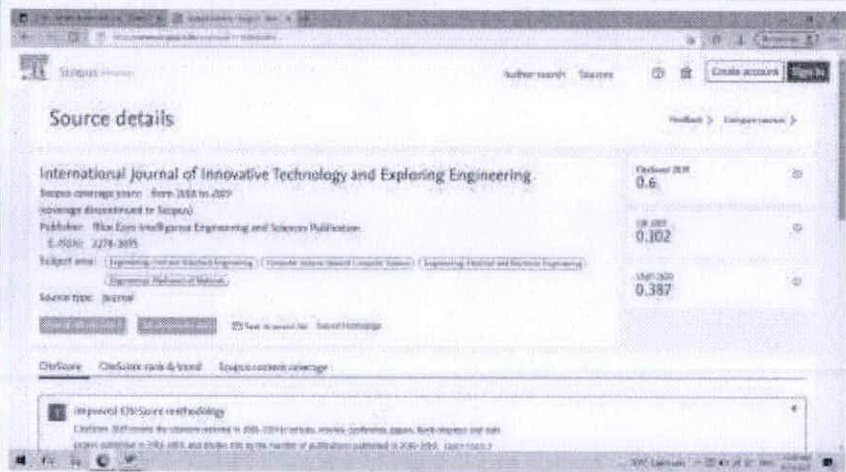
DOI: <https://doi.org/10.31838/ijpr/2020.12.02.247>

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Automating the Drug Dosage of Tacrolimus for Liver, Renal Transplant Patients using Neural Network	Aswathy Wilson	CSE	International Journal of Innovative Technology and Exploring Engineering (IJITEE)	2019-2020	2278-3075	Scopus



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International Journal of Innovative Technology and Exploring Engineering (IJITEE)
 ISSN: 2278-3075, Volume-9 Issue-252, December 2019

Automating the Drug Dosage of Tacrolimus for Liver, Renal Transplant Patients using Neural Network

Nipitha Thomas K., Aswathy Wilson

Abstract: Tacrolimus is a medical field that helps patients live in the field of their renal disease. There is the largest organ in the body and it is the primary unit to process all the fluids we take, for should keep liver in perfect condition. But only three parts of liver, renal diseases occurred commonly, where kidneys (single of human) and essential subject cause the disease dangerously common. New delivery health have replaced focus. This can cause liver cirrhosis and liver dysfunction. The main solution for this is transplantation surgery. In most of the cases, transplantation surgery are successful. But after few days renal patients become die. It is very common now. This is because of the lack of ideal drug dosage prediction. In all of the medical practitioners calculate manually using some pattern response towards the drug. So it is not a systematic approach. Only purely mathematical approach is available for calculating drug dosage.

To achieve an optimal drug dosage calculation, proposed model will automate this system based on some pattern response like like old patients, drug enough level, Creative Test result, drug result, MELD score or using some artificial intelligence techniques like neural network. The human level memory of both patient and Sub-optimal drug dosage may be deduced from the action of various optimized neural networks. Neural networks provide surgical help in decision. Currently there is no system will automate this dosage calculation. This calculation based on patients response after transplantation surgery. Necessarily meet with some level change of medication. After few days the ideal drug dosage calculation observed based on some observing patients different level of drug. Automate this system will help to decrease an calculate automatically the optimal dosage of drug makes precise calculation in the patient health.

Keywords – Artificial Intelligence, Artificial Neural Network, MELD score, Tacrolimus

I. INTRODUCTION

In medical field, there were lot of medical practitioners implemented with the help of computer applications nowadays. Today it is necessary to keep all detailed patient's data using computer. Many of the technologies developed for medical imaging (CT scan – MRI) used implemented using computer technologies. Multiple technologies (including surgical robots and rehabilitation centers) are widely used for many of the surgical treatments. The use of computer applications range in health care will be widely increased. Currently the applications of computer technologies are widely used in drug therapy also. In this the major requirements will concentrate on optimal drug dosage calculation.

Because liver variability and individual variability in requirements of dosage formerly are guided by physician (specialist) drug management, which gives to frequent variations from the objective dosage ranges [1]. Naturally once a particular drug is chosen, the pharmacokinetic clinical principles are required to ensure the precise management of drug in chosen for an administration appropriate case. On the basis of the patient's handling parameters of drug, which require a combination of rate basic pharmacokinetic variables and constants, absorption, distribution, the regimen of dosage for the medicine in a appropriate patient can be developed. It is necessary to ensure that the appropriate regimen is provided to achieve optimal adequacy and minimal toxicity. Nowadays there were lot of liver and kidney diseases widely increased. The number of the patients were highly influenced these type of chronic diseases. Some of the diseases which will lead to the transplantation of liver or kidney [1].

These are:

- viral hepatitis
- Alcoholic liver disease
- Autoimmune hepatitis
- Acute liver failure
- Autoimmune
- such as tropical & A hepatopathy
- Nephrotic syndrome
- Cirrhosis liver problems

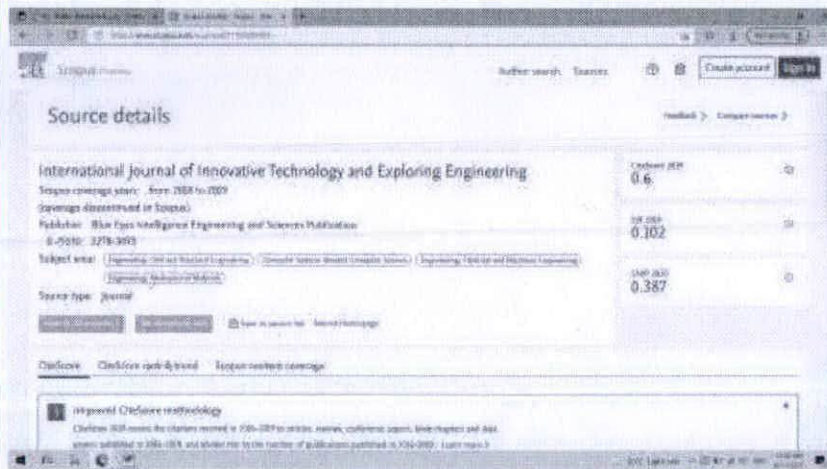
for these liver, kidney failure, the only solution for this is liver, kidney transplantation. Here the major reason for the lifestyle change of mal-nutrition affect health in between people whose sluggish lifestyle of human and evaluated about above has also the reasons for this kind of liver, kidney diseases [2]. Transplantation is the procedure of the replacement of tissue from one part of the body or from one individual and its implantation or insertion in another. Most of the organs will be transplanted nowadays. Transplantation have vital role in survival of patients. In case of transplantation, sometimes in the main drug used for suppressing the immunity. For every patient receive an organ or tissue from someone else during surgery of transplantation, that person's immunity system may observe that it is foreign. It is because of the person's immune system distinguish that the antigens on the cells of the organ are different. Misdirected response, or immune that are not matched usually enough, can generate a blood antibody reaction or transplant rejection.

Received November 08, 2019; revised December 05, 2019; accepted December 15, 2019.
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 Aswathy Wilson, M.Tech, MCA, M.Sc, M.Phil, B.Ed, Jyothi Engineering College Cheruthuruthy, Cheruvu, Kerala, India.

Research Number: 20191102025202019040002019
 (http://dx.doi.org/10.1109/IJITEE.2019.88115)

Published by: Jyothi Engineering College
 Cheruthuruthy, Kerala, India.

Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Performance Analysis of different Classifiers for Earthquake prediction: PACE"	Ninu Francis	CSE	International Journal of Innovative Research in Technology, IJIRT	2019-2020	2278-3075	Scopus



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© July 2020 | IJIRT | Volume 7 Issue 2 | ISSN: 2349-6002

Performance Analysis of different Classifiers for Earthquake prediction: PACE

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Abstract— Earthquake are catastrophic geo-hazardous that endangers human life. Predicting the occurrence of earthquakes is very helpful to reduce the harmful effects. Therefore, a system to predict the forthcoming earthquakes and assess warning promptly are very appealing. There have been researches going on in the machine learning area to predict the earthquakes by the statistical methods based on the previous events recorded. However, the prediction of earthquakes suffers from the class imbalance problem as these events occur very rarely. This system is built to analyze the performance of various machine learning algorithms. The class imbalance problem of the data set is solved using the resampling method. The system is tested using different algorithms namely: Support Vector Machine, K-Nearest Neighbour, Decision Tree, Logistic Regression and Naive Bayes. The performance is evaluated based on the values of accuracy, precision, recall, and f-measure. To increase the performance, k-fold cross-validation is implemented and performance is again evaluated. This cross-validation is carried out for three different values of k such as 5, 10 and 15. The system is evaluated with both class imbalance problem prevailing dataset and class imbalance problem resolved dataset. The performance is plotted and the optimum value of k for k-fold cross validation is found out. It also identifies which classifier is best for the prediction of earthquakes.

Index Terms— Decision Tree, Earthquake, K-fold cross-validation, K-Nearest Neighbour, Logistic Regression, Machine Learning, Naive Bayes, Support Vector Machine

1. INTRODUCTION

Human faces many natural disasters like flood, earthquake, landslide and volcano in their life. These disasters cause great loss to human life. The main issue with these disasters is that they are sudden in nature. Inevitably, investigations are going on in predicting these disasters based on the previously occurred events. Earthquake are one of the major catastrophic phenomena and their unpredictability causes severe destruction to human life. Earthquake, are results of the sudden release of energy in the Earth's crust. This results in the shaking of earth which is termed as the earthquake. This also creates seismic energy waves known as seismic waves. PACE is based on the quantitative earthquake dataset and the use of machine learning algorithms for differentiating the hazardous and non-hazardous region. Supervised learning techniques is employed as earthquake prediction is a classification problem. Algorithms used for the study are SVM, Naive Bayes, K-Nearest Neighbour, Logistic Regression and Decision Tree. Even though logistic regression is considered as a regression algorithm, its output will be either 0 or 1. Thus it can be used for classification problem. Each algorithm will classify the data into the hazardous region or non-hazardous region. The splitting of the dataset into the training set and the test is done using the stratified method and k-fold cross validation. Finally the system is evaluated with the imbalanced dataset and then with the balanced dataset. Finally, the performance is evaluated based on accuracy, precision, recall and f-measure and the best classifier for the earthquake prediction problem is identified. K-fold cross-validation is carried out for three different values of k such as 5, 10 and 15. All the performance results are plotted and the optimum value of k for k-fold cross validation is also identified.

II. LITERATURE SURVEY

The literature survey includes papers which covers almost all aspects of earthquake detection. The details of some papers are given here:

IJIRT 1809409 INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH IN TECHNOLOGY 142

Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Enhanced sparse representation classifier for text classification	Unnikrishnan P	CSE	Expert Systems with Applications	2019-2020	0957-4174	Web of Science

The screenshot shows the journal's home page on the Elsevier website. The journal title 'EXPERT SYSTEMS WITH APPLICATIONS' is prominently displayed. Below it, there is a table with 'General Information' including 'Indexed/Refereed', 'First Year Published', 'Current Vol Year', and 'Primary Language'. The 'Indexed/Refereed' section is checked, and 'First Year Published' is listed as 1990. The 'Current Vol Year' is 34, and the 'Primary Language' is English. There is also a 'Web of Science Coverage' section.

The image shows the front cover of the journal 'Expert Systems With Applications'. The cover features the Elsevier logo on the left and the journal title in a large, bold font in the center. Below the title, the journal homepage URL 'www.elsevier.com/locate/eswa' is provided. The cover also includes a small graphic of a tree and a person, which is the Elsevier logo.

Enhanced sparse representation classifier for text classification
 Unnikrishnan P., V.K. Govindan, S.D. Madhu Kumar
 Department of Computer Science and Engineering, National Institute of Technology Calicut, India

ARTICLE INFO
 Article history:
 Received 20 July 2018
 Revised 2 April 2019
 Accepted 2 April 2019
 Available online 3 April 2019

Keywords:
 Text classification
 Sparse representation
 Orthogonal matching pursuit
 Dictionary

ABSTRACT
 Classification of text based on its substance is an essential part of analysis to organize extremely large text data and to mine the relevant information contained in it. It is gaining greater attention with the surge in the volume of on-line data available. Classical algorithms like k-NN (k-nearest neighbor), SVM (Support Vector Machine) and their variations have been observed to yield only reasonable results in addressing the problem, leaving enough room for further improvement. A class of algorithms commonly referred to as Sparse Methods has been emerged recently from compressive sensing and found numerous effective applications in many areas of data analysis and image processing. Sparse Methods as a tool for text analysis is an alley that is largely unexplored rigorously. This paper presents exploration of sparse representation-based methods for text classification. Based on the success of sparse representation based methods in different areas of data analysis, we intuitively hypothesized that it should work well on text classification problems as well. This paper empirically retrieves the hypothesis by testing the method on Reuters and Weibo data sets. The empirical results on Reuters and Weibo benchmark data show that it can outperform classical classification algorithms like SVM and k-NN. It has been observed that obtaining the basis of representation and sparse codes are computationally costly operations affecting the performance of the system. We also propose a class-wise dictionary refinement algorithm and dynamic dictionary selection algorithm to make sparse coding faster. The addition of dictionary refinement to the classification system not only reduces the time taken for sparse coding but also gives improved classification accuracy. The outcomes of the study are empirical verifications of sparse representation classifier as a text classification tool and a computationally efficient solution for the bottleneck operation of sparse coding.

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1. Introduction
 Text classification or categorization is the process of assigning structured or unstructured text documents to predefined categories or labels. The text can be off-line or on-line and of any size. It is an integral part of the analysis of the text data with wide-ranging applications like document retrieval, opinion mining, email classification, and spam filtering. Text classification process consists of many stages like data acquisition, data analysis and labelling, feature construction, feature weighting, feature selection, feature projection and classifier design. This paper proposes methods to apply the idea of sparse representation in designing the classifier for text classification. Empirical comparisons of our proposal with classical algorithms like k-NN (k-nearest neighbor), Naive Bayes and SVM (Support Vector Machine) indicate the potential of sparse methods as a powerful tool for text classification. Numerous works

have already been reported in literature, using most of the popular classifiers. Majority of the text classification techniques are based on Decision trees, Naive Bayes classifier, k-Nearest Neighbors (k-NN) classifier, Naive Bayes classifier, Support vector machines and Neural Networks.
 Text classification is widely studied by machine learning community and most of the major classification techniques have been applied on this problem with varying levels of accuracy and effectiveness as we can see from the literature (Aggarwal & Zhai, 2012; Murthy & Pasumarthy, 2018). This paper proposes sparse representation based methods as an effective tool for text classification with results outperforming many of the existing approaches like k-NN (k-nearest neighbor), Naive Bayes and SVM (Support Vector Machine). Sparse representation has already found application in diverse areas of data and signal processing, achieving commendable performance. However, with the exception of a few works such as Sainath et al. (2019) and Sharma, Sharma, Thirakandipuzha, and Cheng (2016), sparse methods are yet to find serious attention in the field of document classification.

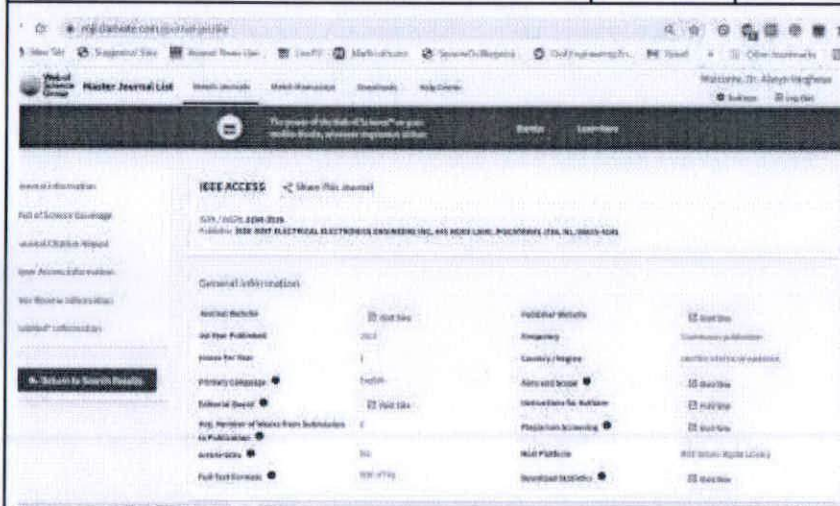
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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Segmentation by fractional order darwinian particle swarm optimization based multilevel thresholding and improved lossless prediction based compression algorithm for medical images	Jarin T	EEE	IEEE Access	2019-2020	2169-3536	Web of Science



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Received November 10, 2019; accepted December 6, 2019; date of current version July 23, 2020.
 Digital Object Identifier 10.1109/ACCESS.2020.3002120

Segmentation by Fractional Order Darwinian Particle Swarm Optimization Based Multilevel Thresholding and Improved Lossless Prediction Based Compression Algorithm for Medical Images

A. AHILAN^{1,2}, CUNASEKARAN MANOGARAN³, C. RAJA⁴, SEIFEDINE KADRY^{5,6}, S. N. KUMAR⁷, C. AGEES KUMAR⁸, T. JARIN⁹, SUJATHA KRISHNAMOORTHY¹⁰, PRIYAN BHALLARAJAN KUMAR¹¹, GOKULNATH CHANDRA BABU¹², N. SENTHIL MURUGAN¹³, AND PARITHASARATHY¹⁴

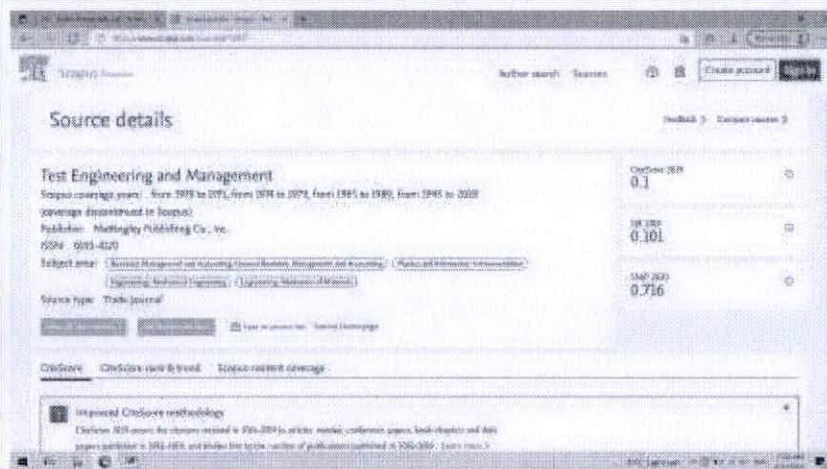
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ABSTRACT The image segmentation refers to the extraction of region of interest and it plays a vital role in medical image processing. This work proposes multilevel thresholding based on optimization technique for the extraction of region of interest and compression of DICOM images by an improved prediction lossless algorithm for telemedicine applications. The role of compression algorithm is inevitable in data storage and transfer. Compared to the conventional thresholding, multilevel thresholding technique plays an efficient role in image analysis. In this paper, the Particle Swarm Optimization (PSO), Darwinian Particle Swarm Optimization (DPSO), and Fractional Order Darwinian Particle Swarm Optimization (FODPSO) are employed in the estimation of the threshold values. The simulation results reveal that the FODPSO-based multilevel level thresholding generate superior results. The fractional coefficient in FODPSO algorithm makes it effective optimization with fast convergence rate. The classification and blending prediction-based lossless compression algorithm generates efficient results when compared with the JPEG lossy and JPEG lossless approaches. The algorithms are tested for various threshold values and higher values of PSNR indicate the proficiency of the proposed segmentation approach. The performance of the compression algorithm was validated by metrics and was found to be appropriate for data transfer in telemedicine. The algorithms are developed in Matlab 2019b and tested on DICOM CT images.

INDEX TERMS Compression, Darwinian Particle Swarm Optimization, Fractional Order Darwinian Particle Swarm Optimization, Particle Swarm Optimization, segmentation, thresholding.

I. INTRODUCTION
 Image segmentation refers to the process of extraction of the desired region of interest in medical images, the region of interest represents anomalies or anatomical organs. Image compression role is inevitable for data storage and transfer in telemedicine. The lossless compression algorithms are preferred for medical images since the reconstructed image quality is good for the validation by physicians. The thresholding is a classical segmentation technique and many variants like adaptive thresholding, bi-level thresholding, local thresholding based on specific features and thresholding based on optimization techniques are there in literature. Mostafa et al. [1] used Adaptive Particle Swarm Optimization (APSO) for optimal selection of threshold in benchmark images, lower error rates were generated when compared with Otsu's and Genetic algorithm (GA).

Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Neural Proliferation using Brain stimulation Methods Intended for Pediatric Neuropsychiatric Population: A Hypothesis and Theoretical Investigation	Jarin T	EEE	Test Engineering and Management	2019-2020	2169-3536	Scopus



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Received December 02, 2019; accepted December 16, 2019; date of current version July 23, 2020.
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Segmentation by Fractional Order Darwinian Particle Swarm Optimization Based Multilevel Thresholding and Improved Lossless Prediction Based Compression Algorithm for Medical Images

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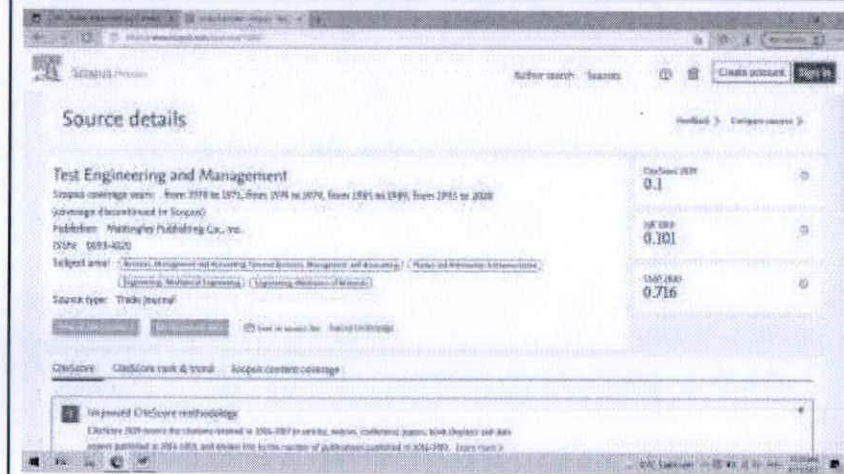
ABSTRACT The image segmentation refers to the extraction of regions of interest and it plays a vital role in medical image processing. This work proposes multilevel thresholding based on optimization technique for the extraction of regions of interest and compression of DICOM images by an improved prediction lossless algorithm for telemedicine applications. The role of compression algorithm is inevitable in data storage and transfer. Compared to the conventional thresholding, multilevel thresholding technique plays an efficient role in image analysis. In this paper, the Particle Swarm Optimization (PSO), Darwinian Particle Swarm Optimization (DPSO), and Fractional Order Darwinian Particle Swarm Optimization (FODPSO) are employed in the estimation of the threshold value. The simulation results reveal that the FODPSO based multilevel level thresholding generates superior results. The fractional coefficient in FODPSO algorithm makes it effective optimization with fast convergence rate. The classification and blending prediction-based lossless compression algorithm generates efficient results when compared with the JPEG lossy and JPEG lossless approaches. The algorithms are tested for various threshold values and higher value of PSNR indicates the proficiency of the proposed segmentation approach. The performance of the compression algorithm was validated by metrics and was found to be appropriate for data transfer in telemedicine. The algorithms are developed in Matlab2016a and tested on DICOM CT images.

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Intelligent Parking Management System using Dijkstra's Algorithm with Driver Preferences	Jarin T	EEE	Test Engineering and Management	2019-2020	2169-3536	Scopus



January - February 2020
ISSN: 0193 - 3120 Page No. 9186 - 9194

TEST

Intelligent Parking Management System using Dijkstra's Algorithm with Driver Preferences

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Article Info
Volume: 02
Page Number: 9186 - 9194
Publication Date: January-February 2020

Abstract
Car Park is a dynamic system where cars are constantly entering and leaving the parking area. The aim of this work is to develop an algorithm that assigns a parking slot based on the driver's criteria, especially in a multi-building Car Park. Here, the driver's preferences are considered while choosing a slot to park his/her car. Some of these preferences include driving distance, walking distance, environmental factors, and other factors. Here the driving distance is the shortest path between the entrance and the assigned parking slot. It is done by using Dijkstra's Shortest Path algorithm. Walking distance is the Euclidean distance between the multi-building entrance and the parking slot. Environmental factors considered here are car occupancy at both sides of a slot and slope of the slot. Other factors include realistic constraints (like entrance or exit) in the study and a slot assignment strategy of FLC. The principles of fuzzy logic are being applied here for helping the driver to make a decision on which slot to choose by assigning fuzzy weights to the values.

Keywords: Car parking optimization; Dijkstra's Shortest Path algorithm; Euclidean distance; Fuzzy logic.

1. Introduction

The common method of finding a parking space in a multi-building Car Park is to find it manually which is time consuming and may lead to the worst case scenario of not finding a slot, especially if the driver is driving in high traffic conditions. The alternative is to choose a pre-defined parking space with high capacity. However, this is not an optimal solution as the car park could usually be far away from the user destination. The main motivation behind this study is the fact that not much research has been done in the area of automating the selection of a parking slot based on the driver's preferences.

Recently, research has used vehicle-to-vehicle and vehicle-to-infrastructure interaction with the support of various wireless network technologies such as Radio Frequency Identification (RFID), ZigBee, Wireless Mesh Networks and the Internet [4]. This work initially targeted to conduct a study of providing information about nearby parking spaces for the driver and make a reservation prior to his/her arrival to the car park using supported devices such as Smartphones, or Tablet PC's. Later the work has been extended to choose a convenient parking slot in a car park

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Simulation on the generation of electricity from running train wheels.	Jarin T	EEE	International Journal of Mechanical and Production Engineering Research and Development	2019-2020	2249-8001	Scopus

Source details

International Journal of Mechanical and Production Engineering Research and Development

Scopus coverage years: From 2016 to 2020 (coverage discontinued in 2020)

Publisher: TransStellar Journal Publications and Research Consultancy Private Limited (TJPRC)

ISSN: 2249-8001 E-ISSN: 2249-8001

Subject areas: Engineering, Mechanical Engineering, Engineering Research & Technology, Chemical Engineering, Materials Engineering, Textiles

Source type: Journal

Q1 Index: 0.7

Q2 Index: 0.202

Q3 Index: 0.547

International Journal of Mechanical and Production Engineering Research and Development
 Volume 17, Issue 17, 2019-2020
 ISSN: 2249-8001 E-ISSN: 2249-8001
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TRANS STELLAR
 Journal Publications - Research Consultancy

SIMULATION ON THE GENERATION OF ELECTRICITY FROM RUNNING TRAIN WHEELS

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ABSTRACT

The existence of industrial wastes and/or commercial wastage depends on the cost and continuous supply of electrical energy. When the advancement of a country is dependent on production of per capita units of electrical energy, the case is in the case of train, the major network of transport is built. This paper explains on the design of electrical energy in the supreme advanced technique. In this paper electrical energy is used for the generation of electricity. When associated various parameters of energy like solar, fuel cell etc., the electrical energy has various diverse efficient ways and means for producing electricity. This paper proposes of using an innovative power station at the foot path of the railway, not far away from the foot path is located. The prevailing structure of train wheels are opened to the making of electricity and other waste which is available to the rail. These waste after being used the removed oxygen is captured and transformed. The obtained electrical energy supply that can be used as alternative power supply for railway station such as power increasing, changing electrical signals, LED display supply for train etc. This can be achieved by lighting the position, fuel, jet, signal light etc. Most conduct like the Mumbai, Chennai and Delhi etc. in India and where can be definitely implemented. The proposal of the corresponding scheme applied at the extreme end separate path in the railway station or when essential in interconnection nearby near city, can afford electricity free of cost for major scale system.

KEYWORDS: Alternative Energy, Train Wheel, Rail, Pedest, Regenerative Braking, Conversion, Alternative Speed, Traction Strength & Feeding Mode

INTRODUCTION

An electric power generating has an additional source of prime energy in the electricity generation and its development. While considering the electrical efficiency, this is the energy method that used in the conversion of electric using electricity [1, 2]. There are further developments from various distribution, in addition electrical power storage and its recovery by means of pumped storage methods, are approved by electric power industry. Electrical energy is an instant produced of power station mainly driven by heat engines, fuelled by combustion or nuclear fission by using electromechanical generators. This suitable system occurs by an energy source which is comparable to kinetic energy of flowing water and wind [2]. Ideally the energy across conversion of mechanical power, as well as solar photovoltaic.

The main factor of generation of electricity has defined by several methods but depend on the demand and utility it deserves. The region where the generation of the system implemented also has an importance. These

Original Article

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Investigation on novel bulk size single crystal of Glycine with metal ions grown by solution growth method for photonic applications	B. Deepanraj	ME	Materials Letters	2019-2020	0167-577X	Web of Science

Materials Letters

Investigation on novel bulk size single crystal of Glycine with metal ions grown by solution growth method for photonic applications

R. Vivekanandhan¹, S. Sathyanarayanan², B. Deepanraj¹, Geetha Palani³, V. Chithambaram^{3,4}

1. Introduction

For the past few years, there has been a high quality and low cost optical (MO) crystals continues occupy the center stage towards a range of applications in the field of photonics and optoelectronic technologies. Extensive studies have been made on the synthesis and crystal growth of some NLO frequency conversion materials because of their good optical properties in frequency doubling, optical modulators, optical switching, and optical memory for the emerging photonic devices in various communication, signal processing and optical interconnectives [1-3]. In this investigation, a successful attempt has been made to grow a novel single crystal of Glycine that is non-diffractive by solution growth method and to study their optical and mechanical properties [4-6].

2. Crystal growth

The starting material was synthesized by taking Glycine and Potassium Dichromate in the equal molar ratio. The calculated amount of Glycine and Potassium Dichromate was dissolved in distilled water at room temperature. The prepared saturated solution was allowed to evaporate at room temperature. During the slow evaporation, the crystalline starts growing the way for the seed crystals to be formed. After a little crystalline formation, a good quality single seed crystal was chosen for the growth of bulk crystal. The seed crystal used with a diameter was placed again in the same or adjacent position of the saturated solution in to allow the bulk crystal to be grown. As slow evaporation continues then affects the growth process and the growth was up to chosen in Fig. 1. Crystals of bulk having the dimensions of 10 × 5 × 2 mm³ have been grown within 27 days as shown in Fig. 1b.

3. Results and discussion

3.1 Single X-ray diffraction analysis

The single crystal XRD instrument (BRUKER D8 ADVANCE X-ray diffractometer) is used to collect diffraction patterns and spinel group. It was observed that the crystal belongs to spinel system with the following cell dimensions: A = 7.412 Å, B = 3.591 Å, c = 12.471 Å, α = 90°, β = 97°, γ = 90° and volume 700 Å³ with face-centered symmetrical space group D_{2d}.

3.2 UV-Visible Spectroscopy

The optical absorption spectrum for the grown CrCl₃ single crystal of 3 mm thickness was recorded in the range 200-800 nm using Varian Cary - 50 Sp spectrophotometer and is shown in Fig. 2

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Materials Letters

Investigation on novel bulk size single crystal of Glycine with metal ions grown by solution growth method for photonic applications

R. Vivekanandhan¹, S. Sathyanarayanan², B. Deepanraj¹, Geetha Palani³, V. Chithambaram^{3,4}

Abstract

Single crystals of Glycine Potassium Dichromate (GDC) were successfully grown by slow evaporation method at room temperature. Single crystal X-ray diffraction was utilized to study the lattice parameters and to confirm the crystal system. The functional groups present in the grown GDC crystals were identified by the FTIR spectral analysis. The optical absorption study was carried out by using ultraviolet laser and was employed the grown crystal with thickness analysis of the change in optical transmittance. The mechanical hardness of the samples has been studied. The structure of the grown potassium glycine was observed using XRD with the help of unit cell dimensions of 10x5x2 mm³ and volume of 700 Å³ with face centered symmetry. The optical absorption spectrum for the grown GDC single crystal of 3 mm thickness was recorded in the range 200-800 nm using Varian Cary - 50 Sp spectrophotometer and is shown in Fig. 2

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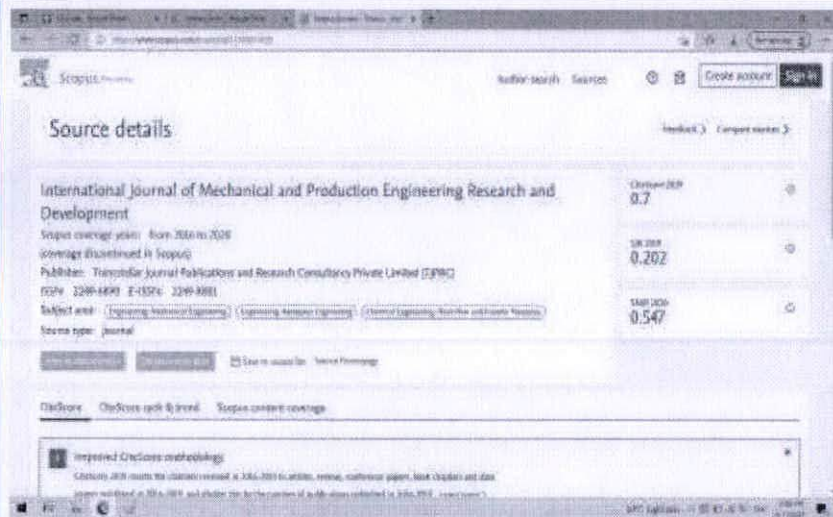
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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
An Experimental Analysis And Optimization Of Heat Treatment Parameters Of Al6061 Alloy For Improved Mechanical Properties	B. Deepanraj	ME	International Journal of Mechanical and Production Engineering Research and Development	2019-2020	2249-8001	Scopus



International Journal of Mechanical and Production Engineering Research and Development (IJPED)
 Volume 10, Issue 10, October 2020, pp. 1-10
 ISSN: 2249-8001, E-ISSN: 2249-8001
 The Journal is Indexed in Scopus, Engineering Index, Engineering Index Online, Chemical Engineering, Science and Technology, and Engineering Index Online.



AN EXPERIMENTAL ANALYSIS AND OPTIMIZATION OF HEAT TREATMENT PARAMETERS OF AL6061 ALLOY FOR IMPROVED MECHANICAL PROPERTIES

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ABSTRACT
 This present work, to optimize the heat treatment behavior of Al6061 aluminum alloy experimentally and optimize the results of tensile, impact strength and corrosion rate the identified input variables viz., aging temperature, medium of aging and time period of heat treatment using The Taguchi for Study of Performance by Software in Latin Solution (TOPSIS). Taguchi's Design of Experiments, a suitable as orthogonal array is used for performing the experiments. Analysis of Variance (ANOVA) an analysis of has been used to study the most response parameters. The optimized results achieved were: aging temperature of 450°C, oil as quenching medium and aging time period of 10 min. ANOVA result shows that the aging temperature was the most significant parameter, which influences the output response with an error percentage of 8.15%. At the same time it is noted that the performance of the thermal process can be improved by identifying the most critical parameters using TOPSIS.

KEYWORDS: Taguchi's Technique, ANOVA, TOPSIS & Aging Temperature

INTRODUCTION
 Heat treatment in foundry sector, is a process of the heating and cooling tasks that are done to change the mechanical properties and the metallurgical structure of a metal item (Eglin & Zachary, 1994). In aluminum composition, heat treatment is every more, and again linked to the specific tasks, although for the spot and featured combinations for improving the hardness and quality (Mishra & Prasad, 1979), which are generally obtained as the "heat-treatable" corresponds to recognize them from those alloys in which no noticeable hardening can be accomplished by heating and cooling. The heat-treatable, "non-heat-treatable" conditions, depend basically on work as a special quality. Having to diminish quality and treatment of metals is utilized with components of the cast with metallurgical responses may change with kind of component and, with level of softening material. Aside from the low-temperature adjustment is achieved in some cases given the series of these alloys, total or fractional heating are the main ones utilized for non-heat-treatable alloys (ASME, 1991). One fundamental trait of a precipitation-type of alloy has during treatment is temperature-dependent behavior strong solubility described by expanding ductility with expanding temperature (Srinivas et al., 1996; Chong et al., 2012; Chong et al., 1978). In this condition, this condition is met by a large portion of the binary system for aluminum alloy, and normally they are not viewed as heat-treatable. Alloys of the aluminum-silicon (Kumar et al., 1992) and aluminum-magnesium, display considerably substantial changes in mechanical properties because of various

Original Article

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Investigation and Optimization of Machining Parameters Influence on Surface Roughness in Turning AISI 4340 Steel	B. Deepanraj	ME	FME Transactions	2019-2020	2406-128X	Web of Science

The screenshot shows the journal's website interface. At the top, there is a search bar and navigation links. Below that, the journal title 'FME TRANSACTIONS' is displayed. A sidebar on the left contains various filters for searching, including 'Year Published', 'Issue No', 'Price Range', 'Material Used', 'Avg. Number of Books from India', 'Books Only', and 'Full Text Format'. The main content area shows 'General Information' for the journal, including its website URL, address, and contact details. A green signature 'Anand' is written over the page, along with the name and credentials of Dr. Sunny Joseph Kalayathankal, who is identified as the Principal of Jyothi Engineering College.

The cover page of the journal article features the title and authors' names: Balaishnan Deepanraj, Lakshminipathi Anantha Ramani, and Natarajan Senthilkumar. It includes their respective departments and affiliations. The abstract discusses the experimental investigation of machining parameters (cutting speed, feed rate, and depth of cut) on the surface roughness of AISI 4340 steel. It mentions the use of Taguchi's technique and ANOVA to determine the most significant factors. The keywords listed are Machining parameters, Surface roughness, Taguchi's Technique, and ANOVA. The page also includes an introduction section and a table of contents.

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Production, optimisation and engine characteristics of beef tallow biodiesel rendered from leather fleshing and slaughterhouse wastes	B. Deepanraj	ME	Biomass Conversion and Biorefinery	2019-2020	2190-6823	Web of Science

The screenshot shows the journal's website interface. At the top, there's a navigation bar with 'Web of Science Group' and 'Master Journals'. Below that, the journal title 'BIOMASS CONVERSION AND BIOREFINERY' is displayed. The page includes a search bar, a list of articles, and a 'General Information' section with details like 'Journal Website', 'Volume', 'Frequency', and 'Language'. A blue stamp 'Annals' is written across the page.

ORIGINAL ARTICLE

Production, optimisation and engine characteristics of beef tallow biodiesel rendered from leather fleshing and slaughterhouse wastes

J. Harjitha¹ · S. Gokul Rajgurunathan^{1,2} · S. Vijayarajkumar¹ · B. Deepanraj³

Received: 28 April 2019 / Revised: 10 August 2019 / Accepted: 28 August 2019
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Abstract
Presently, biodiesel is considered as an effective alternate fuel owing to its high sustainability and abundance. This paper concentrates on the biodiesel production from waste beef tallow rendered from slaughterhouse and its conversion for engine characterisation. The maximum fuel output was estimated to be 9.25% and 1.03%, whereas maximum rendering efficiency was determined to be 92% and 20% for methanol and tetrahydrofuran, respectively. The rendered waste tallow was converted into biodiesel using ethanol as a solvent and calcium amide chloride methyl sulphide complex (Ca-VOx/MS) as a novel alkaline catalyst. The most optimal reaction parameters were 80 h, 100 °C, 1:1.75 catalyst concentration, 0.20 wt% of tallow, reaction temperature of 25 °C and reaction time of 160 min. Properties of the produced biodiesel have been tested in accordance with ASTM standards, when the results were found to be within the permissible range. The engine characteristics in diesel exhibited increased fuel efficiency and maximum cylinder pressure, reduced emission levels than compared to ordinary diesel. In addition, its performance characteristics were similar to diesel, thereby making it a suitable replacement for existing diesel fuel.

Keywords Bioethanol · Amine · Sulfur · Tetrahydrofuran · Sulfur · Calcium amide chloride complex · Fatty acid ester · Ca-VOx/MS

1 Introduction
Global industrialisation and expanding population growth have resulted in larger energy demand, leading to depletion of fossil fuel reserves and increased pollution level caused by these non-renewable energy resources. In addition, nuclear and coal are not a viable option to meet the growing energy demand as they are usually categorised based on their non-renewable nature and are predominantly obtained without proper disposal techniques. These wastes have been the root cause for various anthropogenic activities like air contamination, water and air pollution, and environmental activities which has an adverse effect on every living thing on this planet [4]. Numerous studies have been carried out to manage these wastes effectively, convert them into a useful product, or dispose it properly through suitable disposal techniques. One such study proposes the effective conversion of these wastes into energy sources, which has the ability to reduce the growing global demand for energy [22].

Accordingly, leather fleshing and slaughterhouse wastes are such waste discarded from industries and slaughterhouses with good energy potential but cannot be directly used for power generation owing to numerous constraints associated with its nature, availability and its properties (thermal and physicochemical) [5]. However, if rendered from these wastes can be used the power production using proper treatment and conversion techniques. One such technique is the transesterification of rendered fat into biodiesel which is a chain linked with alkyl ester through ester group which reduces its viscosity and makes it suitable for CI engines. Biodiesel is highly regarded for its renewability and self-sustainability, lower toxicity, and higher biodegradability with enhanced combustion rate and reduced emission characteristics. In addition, the non-toxic biodiesel has improved solvent properties along with high oxygen content, low sulphur and aromatic content [34].

Annals

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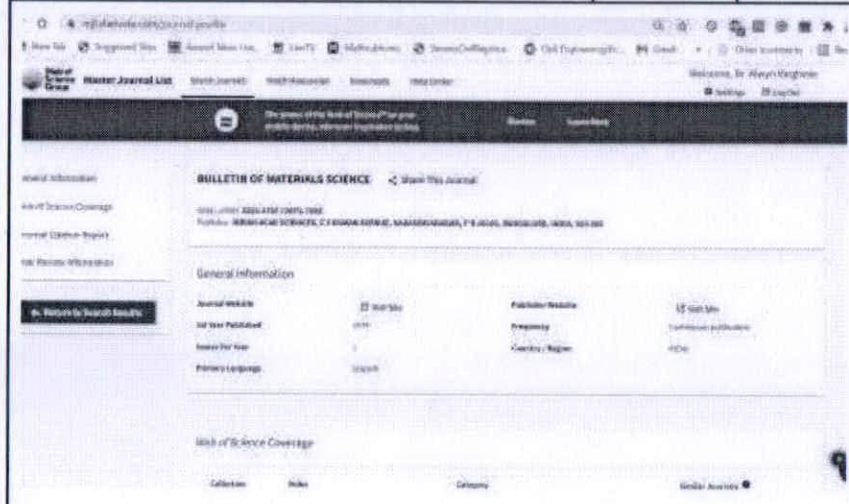
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Published online: 08 September 2019

Springer

Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Investigation on single crystal by tartaric acid–barium chloride: growth and characterization of novel NLO materials	B. Deepanraj	ME	Bulletin of Materials Science	2019-2020	0973-7669	Web of Science



And Article Id: 2020145-202
<https://doi.org/10.1007/s13204-020-02159-6>

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Investigation on single crystal by tartaric acid–barium chloride: growth and characterization of novel NLO materials

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MS received 5 March 2020; accepted 20 May 2020

Abstract. The progress of single crystal followed by C₂H₄O₄ (tartaric acid) and BaCl₂ (barium chloride) (TABC) third-order nonlinear optical (NLO) material was synthesized with slow evaporation method using distilled water at room temperature. TABC single crystal was introduced into various characterizations like X-ray diffraction to determine unit cell parameters, Fourier transform infrared spectroscopy (FTIR) to identify functional groups, optical microscopy to study morphology, energy bandgap and UV–vis study have been determined using UV–vis NBE spectra. The thermal stability of the material was investigated by differential scanning calorimetry analysis. The mechanical property was studied using Vickers microhardness test. The surface morphology of the material was determined by scanning electron microscope (SEM). The change in dielectric behavior of TABC with respect to the frequency of frequency at various temperatures has been heavily observed and discussed. The third-order nonlinear optical parameters were measured using Z-scan analysis.

Keywords: Optical material, ZED, microstructure, thermal study, Z-scan analysis

1. Introduction

Third-order nonlinear optical materials have wide applications like optical communication, sensing, signal processing, data storage, optical logic gates, laser radiation protection and THz wave generation [1–5]. In recent years, a broad investigation was performed to develop the nonlinear optical materials with high extensive applications in photonic and optoelectronic fields. Various studies dealing with organic, inorganic and semiorganic crystals for nonlinear optics have been reported. Some organic nonlinear optical materials display an important role in technological industry. An intensive survey of these materials has been reported. The organic materials possess great mechanical, thermal properties with high nonlinear optical coefficient. The development of bulk single crystal is very bright for device fabrication. An inorganic material has inherent third-order optical nonlinear properties of their own nature owing to the absence of selection or conjugation [6–10]. Nevertheless, interest has been made to grow the semiorganic crystals with less dispersion, high laser damage threshold, exception of mechanical and thermal properties, low angular sensitivity, wide optical transparency, which makes

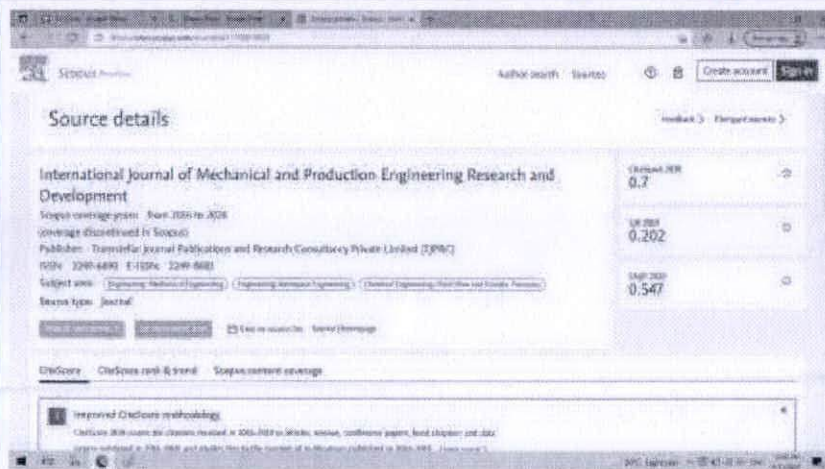
the material considerable for device fabrications [11–13]. Lakshmi et al. [14] synthesized nonlinear optical materials of *N,N*-diphenylbutanamide (NDBP) and 4-dimethyl-*N,N*-diphenylbutanamide (FNNDBP). The NDBP and FNNDBP crystal studied using UV–vis study IR spectra showed widths of 1000 in the visible area. Its thermal stability to 483 and 503 K. Second-harmonic generation (SHG) productivity was calculated by the Kurtz–Pary powder method, which is 1.55 and 1.7 times as that of potassium dihydrogen phosphate. Prabhakaran et al. [15] have analyzed *N*-methyl-4-methylbenzamide, *N*-methyl-*N*-(4-methylphenyl)benzamide, 4-dimethyl-*N*-methyl-*N*-(4-methylphenyl)benzamide and 4-methyl-*N*-methyl-*N*-(4-methylphenyl)benzamide single crystals through the slow evaporation solution process. In these crystal structures, thermal analysis was carried out and the efficiency of SHG was 2.25 times higher than the potassium dihydrogen phosphate (KDP) crystal.

L-tartaric acid is a prominent organic nonlinear optical material. In this study, we report tartaric acid barium chloride (TABC) a third-order nonlinear optical, samples studied by solution growth technique. TABC single crystal was introduced into various characterizations like X-ray

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
The Low Cost Adult Diaper Waste Management Method	Nice Menachery	ME	International Journal of Mechanical and Production Engineering Research and Development	2019-2020	2249-8001	Scopus



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International Journal of Mechanical and Production Engineering Research and Development (IJMPERD)
 ISSN(P): 2249-800X, ISSN(E): 2249-8017
 Vol. 9, Special Issue, Aug 2019, 185-188
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THE LOW COST ADULT DIAPER WASTE MANAGEMENT METHOD

NICE MENACHERY, SREERAG V NAMBIAR, SANGEETH S, VISHNU THILAK A, NIGIL SEBASTIAN & SHABIN K JOBY

Department of Mechanical Engineering, Jyothi Engineering College, Theloor Kerala, India

ABSTRACT

The current situation of waste disposal constantly embraces a potential danger in environmental degradation. Due to disregard of authorized, fast filling landfills is becoming a troublesome. Diaper is creating a hefty involvement towards solid wastes without making an allowance for inadequate landfill space. The government is taking keen interest in building up proper sanitation facilities which essentially intend for a hygienic environment but dumped diapers still remain a menace. Traditional method of diaper disposal is unhygienic. In urban areas, most of them are sealed in a plastic bag and moved to landfills, while in rural areas, the major prospect is to burn them. This paper proposes an economic and sanitized way of adult diaper disposal, this can be an asset to many houses, hospitals, old age homes, charity trusts etc.

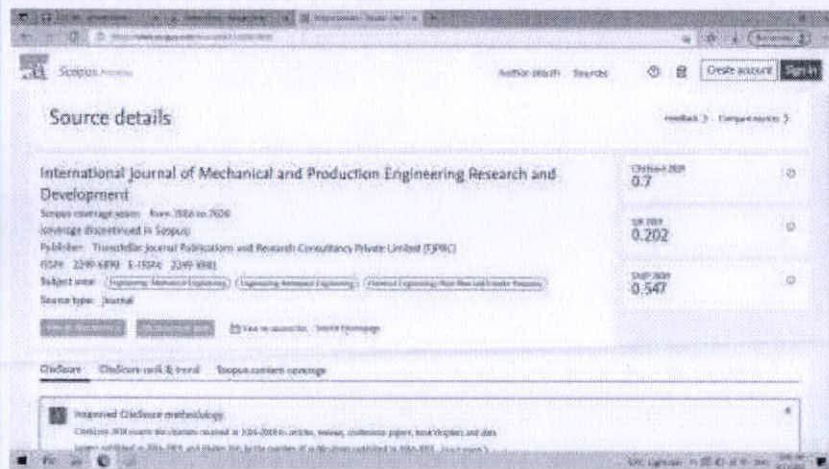
KEYWORDS: Adult Diaper, Solid Wastes, Disposal, Hygienic & Diaper Waste Management

INTRODUCTION

In this 21st century one of the major issues we are facing is the disposal of sanitary wastes. As we all know that this is due to the plastics which are employed in disposable sanitary napkins are non-biodegradable and leads to environment and health threats. The recent study states that a single woman uses nearly 100 kilograms of non biodegradable waste during her menstrual years. A paralyzed person nearly uses six to seven adult diapers per day, this results usage of approximately two hundred adult diapers per month. The life cycle of a single adult diapers is 450 to 500 years. This context is more conspicuous because of the way in which low municipal solid waste is managed and their collection, disposal and transportation network. Moreover, the main problem of sanitary waste has ever been their categorization, i. e, whether it is a bio-medical or plastic waste. Diapers, soiled napkins, tampons, condoms, and blood-soaked cotton are being disposed of after separation into non-biodegradable and biodegradable segments. However, the Bio-Medical Waste Management Rules, 2016 show that objects tainted with body fluids and blood, including cotton, soiled plaster casts, dressings, linens and bedding, are bio-medical waste and must be incinerated, micro-waved or autoclaved to remove pathogens. The need of interest for sanitary waste management in our nation is shown in the evidence that there is no credible statistics on the problem. Due to the need of separation of waste, there is little documentation in this section, so through guidance for treatment and management of sanitary

Original Article

Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
An Optimisation Of Surface Area And Heat Transfer Study Of Rectangular Porous Structure	Nisha Sherief	ME	International Journal of Mechanical and Production Engineering Research and Development	2019-2020	2249-8001	Scopus



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International Journal of Mechanical and Production Engineering Research and Development (IJMPERD)
 ISSN(P): 2249-8001; ISSN(E): 2249-8001
 Vol. 9, Special Issue, Aug 2019, 94-104
 © IJPERD, Pvt. Ltd.



AN OPTIMISATION OF SURFACE AREA AND HEAT TRANSFER STUDY OF RECTANGULAR POROUS STRUCTURE

NISHASHERIEF, SAINTSON, P. A, RICHARD JACOB, E, SANJAI BABU, S & MANISH, F

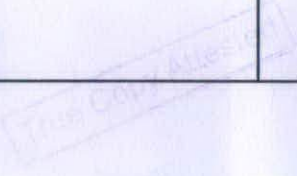
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ABSTRACT
 Heat transfer can be maximized by increasing the surface area which is exposed to convection. Structures which have high surface area compared with volume are called porous structures. In order to increase the surface area of a porous structure to maximum, the fiber width of the structure can be varied. We can maximize the surface area by varying fiber width for the given porosity. Increasing the porosity below a particular point increases the surface area after the limit increasing porosity decreases the heat transfer by decreasing the conductive heat transfer. For the study a cube shaped unit cell model of rabbit's cube is chosen.
KEYWORDS: Heat Transfer, Surface Area, Cube & Porous

INTRODUCTION

In order to improve the durability of an electronic equipment, heat removal can be used as an effective tool. The heat removal rate depends on the area of surface that is exposed to the convection. Depending upon the purpose different size structures is used for increasing the heat transfer rate. According to law of convection, the heat transfer rate can be increased using porous body in thermal system. The usage of porous body will also help reduce weight and space requirement. Porosity can be defined as the measure of the void spaces in a material. It is a ratio of the volume of voids to the total volume. The porosity is expressed between 0 and 1, or as a percentage between 0% and 100%. Materials that contain pores are called a porous material. Matrix is the skeletal portion and the pores are usually occupied by a fluid. By using concept of porous media we can analyze structures like foams, although the skeletal material is normally a solid. This work presents a fresh technique that boosts the heat transfer from the surface by using fins with porosity. The thermal performance of fins with porosity is assessed and paralleled with that of normal solid fins. If we use porous fins in the place of normal fins it will increase the performance of the equal sized normal solid fin and, it will save fin material. The operating parameters, thermal performance of porous fin and the effect of different design is investigated. Ra number, Da number, and thermal conductivity ratio are the examples of these parameters. Increasing the Ra number improves the performance of porous fin. It is found that there is no further improvement in the fin performance after an optimum limit of porosity.

Original Article



Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Biogas from food waste through anaerobic digestion: optimization with response surface methodology	B. Deepanraj	ME	Biomass Conversion and Biorefinery	2019-2020	2190-6823	Web of Science

BIOGAS CONVERSION AND BIOREFINERY

Biogas from food waste through anaerobic digestion: optimization with response surface methodology

B. Deepanraj, S. Joseph, S. Kalayathankal

Abstract

In the current study, anaerobic digestion (AD) efficiency for biogas production and chemical oxygen demand (COD) degradation was assessed through a sequence of laboratory-scale batch experiments to compare the role of chosen process parameters, viz. initial concentration (5–15%), pH (5–9), temperature (30–40 °C), and co-digestion (0–40% of poultry manure). Biogas production and COD degradation were significantly dependent on the selected process parameters with independent conditions to accomplish better performance of the process. Central composite design (CCD) based response surface methodology (RSM) was adopted for evaluation and optimization of the conditions.

Price 34,95 €

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Influence of fatty acid composition on process optimization and characteristics assessment of biodiesel produced from waste animal fat	B. Deepanraj	ME	Energy Sources, Part A: Recovery, Utilization, and Environmental Effects	2019-2020	1556-7036	Web of Science

ENERGY SOURCES PART A: RECOVERY UTILIZATION AND ENVIRONMENTAL EFFECTS

ISSN: 1556-7036 / E-ISSN: 1556-7036
 Publisher: TAYLOR & FRANCIS INC. FOR ENERGY SOURCE, 530 N. ZEEB RD, PROGRESS, ALA 35139

ISSN	ISSN-E	ISSN-I	ISSN-L
1556-7036	1556-7036	1556-7036	1556-7036

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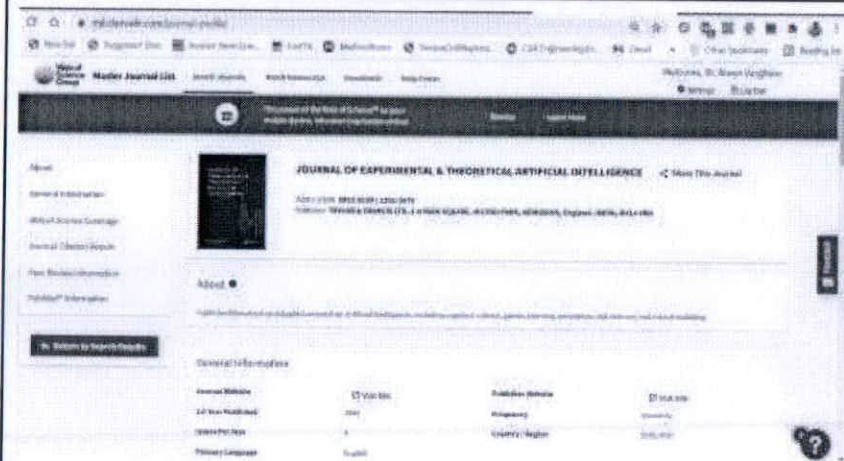
Influence of fatty acid composition on process optimization and characteristics assessment of biodiesel produced from waste animal fat

ABSTRACT

The present study focuses on the process optimization and the detailed assessment of waste animal fat (WAF) (biodiesel) on the influence of fatty acids characterized by a fatty acid methyl ester (FAME) content. The study was conducted using the response surface methodology (RSM) with the aim of determining the optimal process parameters for the production of biodiesel. The results show that the maximum biodiesel yield was found to be 97.7% and 93.8%, respectively. The effect of the acid number, and water content was characterized as the most significant factors in the RSM model. The study also investigated the effect of the acid number and water content on the biodiesel yield and the characteristics of the biodiesel. The results show that the acid number and water content have a significant effect on the biodiesel yield and the characteristics of the biodiesel. The study also investigated the effect of the acid number and water content on the biodiesel yield and the characteristics of the biodiesel.

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Spectral feature and Optimization- based Actor-Critic Neural Network for arrhythmia classification using ECG signal	Anoop V	ECE	Journal of Experimental & theoretical Artificial Intelligence	2019-2020	0952-813X	Web of Science



JOURNAL OF EXPERIMENTAL & THEORETICAL ARTIFICIAL INTELLIGENCE
<https://doi.org/10.1080/0952813X.2019.1692353>

ARTICLE

Spectral feature and optimization- based actor-critic neural network for arrhythmia classification using ECG signal

Anoop Vylala^a and Bipin Plakkottu Radhakrishnan^b

^aECE Department, Jyothi Engineering College, Cheruthuruthy, India; ^bECE Department, Ithiya College of Engineering and Technology, Muvattupuzha, India

ABSTRACT

Arrhythmia classification is an interesting research field that serves as the solution for most of the cardiac-related diseases. The patients with cardiac diseases are experiencing the greatest risk rate of death, and hence, there is a need to identify the presence of arrhythmia in patients to reduce the fatality rate. This paper proposes an arrhythmia classification method, which offers better classification accuracy and releases the time spend for classifying the patients. The proposed method of arrhythmia classification uses the Electrocardiography (ECG) signal to classify the patients with and without arrhythmia. Initially, the wave components are identified from the ECG signal and are subjected to the feature extraction. The spectral and statistical features are extracted from the wave components that yield the texture and the geometric nature of ECG such that classification of ECG becomes effective. The classification is carried out using the Actor-Critic (AC) Neural Network that is trained using the Proposed Taylor-Sine Cosine Algorithm (Taylor-SCA). The Proposed Taylor-SCA algorithm is the integration of Taylor series and SCA. The experimentation is performed using the MIT-BH Arrhythmia Database, and the experimental results show that the proposed algorithm exhibits the maximum accuracy, sensitivity, and specificity of 0.9545, 0.77, and 0.9375, respectively.

ARTICLE HISTORY

Received 4 October 2018
 Accepted 27 July 2019

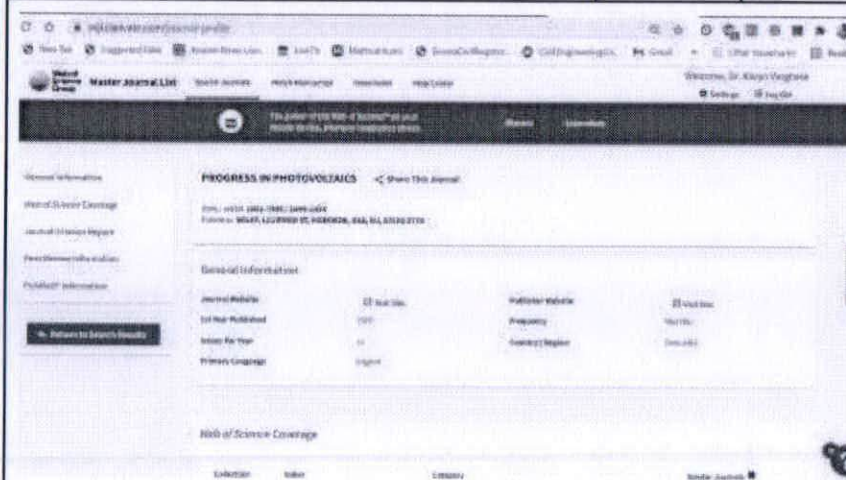
KEYWORDS

Electrocardiography signal; arrhythmia classification; actor-critic neural network; sine cosine algorithm; Taylor series

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
CCGPA- MPPT: Cauchy preferential crossover- based global pollination algorithm for MPPT in photovoltaic system	Anoop V	ECE	Progress in Photovoltaics: Research and Applications	2019-2020	1062-7995	Web of Science



Received: 2 December 2019 | Revised: 15 June 2020 | Accepted: 17 June 2020
 DOI: 10.1002/pip.3315

RESEARCH ARTICLE

PHOTOVOLTAICS WILEY

CCGPA-MPPT: Cauchy preferential crossover-based global pollination algorithm for MPPT in photovoltaic system

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Abstract

In general, the photovoltaic (PV) is considered as the best selection among renewable energy resources due to its nonpolluted operation and good flexibility condition. The PV system is affected because of the partial shading conditions (PSCs), which reduce the generated power. During steady-state operating conditions, there occurs a time delay in tracking the Global maximum power point (GMPP) and Local maximum power point (LMPP) under PSCs using the perturb and observe (P&O) method. In order to overcome such shortcomings, this paper proposed a hybrid algorithm with a P&O technique to improve the maximum power point tracking (MPPT) for the PV system under PSC. In addition to this, the P&O technique is utilized to achieve the LMPP in the first section, and the hybrid algorithm is utilized to achieve the GMPP in the second section. Here, the hybrid technique is the integration of Cauchy preferential crossover (CC) with the flower pollination algorithm (FPA). Furthermore, the exploitation ability of the FPA is enhanced by the CC, and the combined hybrid algorithm has the ability to produce the optimal duty cycle for the DC-DC boost converter for MPPT. Then the proposed method will be executed in MATLAB/Simulink model, and it is contrasted with the existing methods such as CC, current sensorless (CS), and FPA, respectively. The experimental results and analysis reveal that the proposed approach provides better performances when compared with several other metaheuristic algorithms.

KEYWORDS
 crossover, DC to DC boost converter, global maximum power point, global pollination, local maximum power point, photovoltaic, PSC

1 | INTRODUCTION

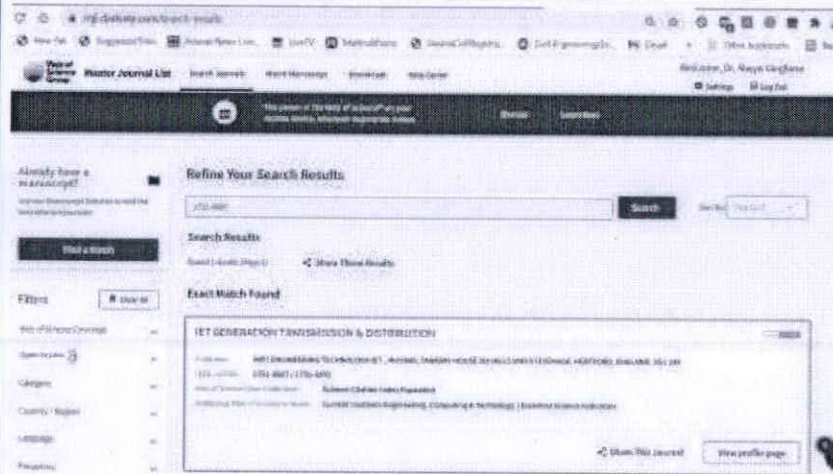
Due to the rapid growth and expansion in business as well as the consistently increasing depleting of existing ways of living, the world supply energy is exposed to a huge strain. This wonder

energy sources, especially renewable energy (RE). Solar energy is a standard among the most vital RE sources, rather than regular nonrenewable assets, for example, fuel and coal.¹ Solar energy is spotless, limitless, and free. The primary utilization of photovoltaic (PV) frameworks is said to be a stand-alone (rural, street and

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Hybrid control of a multi-area multi-machine power system with FACTS devices using nonlinear modeling Journal - IET Generation, Transmission & Distribution	Jose P. Therattil	ECE	IET Generation Transmission & Distribution	2019-2020	1751-8687	Web of Science



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IET Generation, Transmission & Distribution

Research Article



Hybrid control of a multi-area multi-machine power system with FACTS devices using nonlinear modelling

ISSN 1751-8687
 Received on 27th July 2019
 Revised 26th October 2019
 Accepted on 10th February 2020
 © Institution of Engineering and Technology
 doi: 10.1049/iet-gtd.2019.01405
 www.ietdl.org

Jose P. Therattil¹, Jenson Jose², Praveen Raveendran Nair Prasannakumar^{3,4}, Ahmed G. Abo-khalil⁵, Ail S. Alghamdi⁶, Bindu Gopakumar Rajalekshmi⁷, Khairy Sayed⁸

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Abstract: Generally, the mathematical formulation of the dynamics governing multi-area power systems with Unified Power Flow Controller (UPFC) is a challenging task owing to the presence of both differential and algebraic sub-systems. The proposed research work attempts to integrate the two subsystems by replacing the algebraic sub-systems with a differential approximation that leads to a non-linear system of differential equations. Solution of the proposed model with a properly chosen Lyapunov function produce a non-linear control signal which damps inter-area oscillations effectively. The non-linear control signal is realised using the backstepping method. Moreover, the new formulation enables utilisation of the law for uncertain parameters using the standard geometric feedback form, such that the advantage of such a controller is unaffected by these parameters. In addition to this major contribution, full utilisation of UPFC, by using a lone multi-variable PI controller which eliminates negative interaction between the controllers, is also achieved. Empirical verification of the proposed approach is done by simulating various scenarios with varying degrees of complexity – from dual area power networks to 39 buses New England system. The results of the experiments indicate the efficacy of the method.

Nomenclature

- ω_i, δ_i angular speed and rotor angle of i th generator
- ω_{i0}, δ_{i0} initial values of speed and rotor angle
- n_i count of generators
- M_i count of no generator buses
- $P_{m,i}$ input mechanical power of i th generator
- $P_{e,i}$ synchronous output power of i th generator
- D_i coefficient damping of i th generator
- M_i moment of inertia of i th generator
- H_i inertia constant
- V_i, ψ_i voltage and phase angle of i th bus
- B_{ij} reactance elements of admittance matrix
- E_{di} internal voltage of the i th machine
- θ_{se} phase angle of Series VSC
- ψ_{sh} phase angle of shunt VSC
- m_{am} amplitude modulation ratio of series VSC
- m_{sh} amplitude modulation ratio of shunt VSC
- V_{dc} DC-link capacitor voltage
- Q_{di}, P_{di} reactive and active loads of i th bus

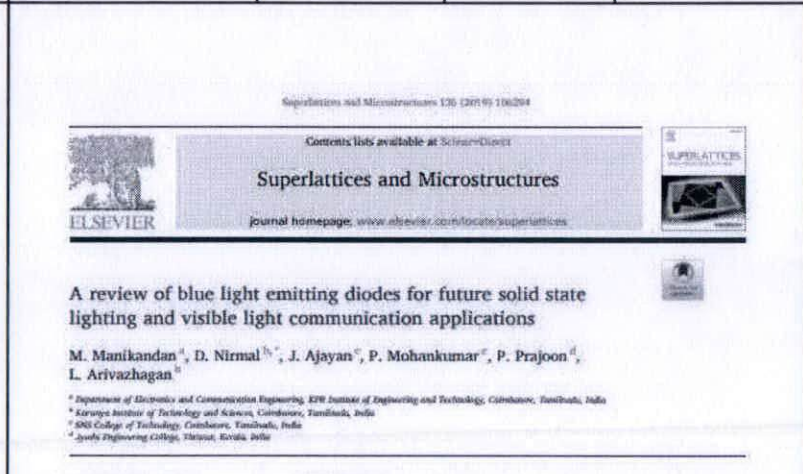
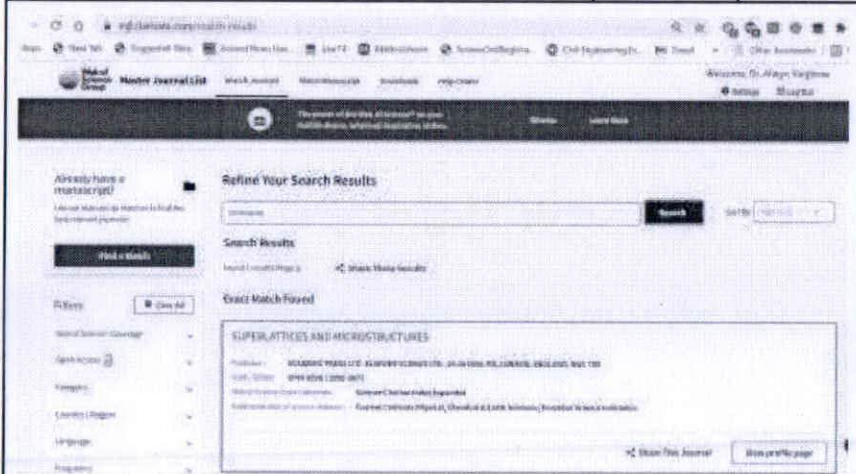
insufficient damping in inter-area modes [8], necessitating more efficient solutions.

With high voltage power electronic techniques becoming competitive and having broad area of operation, flexible AC transmission system (FACTS) devices are gaining growing acceptance. Hingorani and Gyugyi [9] initiated the basics of FACTS. Static Synchronous Compensator performs well in bus bar voltage management while Static Synchronous Series Compensators can manage power flow effectively. When the two are combined in a single device, we get the unified power flow controller (UPFC). An explanation of the elementary ideas is shown in [10, 11]. The modelling and control of the UPFC were tried-out with various approaches. Power injection modes in [12, 13] utilizes the UPFC real and reactive power into the power network as the control input, ignoring the dynamics of UPFC. The better method for governing the UPFC is to use Proportional-Integral technique if the dynamics of UPFC is considered [14, 15]. In damping oscillations which include multiple modes, PI control is less productive. In such cases, a number of lead-lag blocks have to be employed [16]. This, in turn, makes the simulation more complex. Operating several controllers typically introduce mutual dynamic interactions with closed-loop system instability as their imposing consequence. A robust PID controller was suggested in [17] as a workaround which can achieve stability. It did improve the system in terms of transient stability and voltage stability, but the disturbance was limited. Another drawback was poor

1 Introduction

Electrical networks are operated on the verge of their stability limit due to technological and financial constraints. Enhancing the

Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
A review of blue light emitting diodes for future solid state lighting and visible light communication applications, , Superlattices and Microstructures(J), Elsevier,	Prajoon P	ECE	Superlattices and Microstructures	2019-2020	0749-6036	Web of Science



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ARTICLE INFO

Keywords:
 Periodic dielectric crystal (PDC)
 Electroluminescence (EL)
 External quantum efficiency (EQE)
 Multiple quantum well (MQW)
 Super lattice (SL)

ABSTRACT

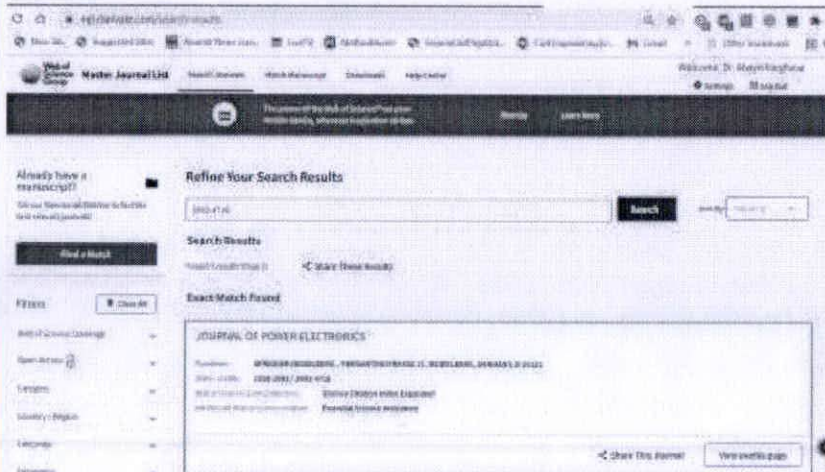
This paper reviews the rapid progress being made in the development of organic/inorganic blue light emitting diodes (LEDs). Blue LEDs exhibit outstanding electrical and optical properties such as low forward driving voltage, high light output power, high brightness and high internal quantum efficiency (IQE). This article highlights the rapid advancements being made in the development of organic/inorganic blue LEDs over the last five decades, efficiency enhancement techniques, efficiency drops in blue LEDs and the techniques to alleviate efficiency drop, recent developments in flexible blue LEDs, degradation mechanisms and reliability issues in blue LEDs, challenges in fabrication and packaging of blue LEDs and it also throw light on the applications of blue LEDs. Their uniqueness in terms of low forward driving voltage, high light output power and brightness and large modulation bandwidth has fuelled the incorporation of blue LEDs in a wide variety of applications such as visible light communication (VLC), solid state lighting (SSL), cellular phone displays, liquid crystal display backlights, flexible flat panel displays, outdoor full color displays, indicators, smart TVs, projection displays and implantable biomedical devices.

1. Introduction

The light emitting diodes (LEDs) have been considered as the most promising light sources for the future due to their unique features like environmental friendliness, high efficiency, low voltage operation and low power consumption, high brightness, small size and excellent reliability [1-3]. The world's first semiconductor p-n junction based red LED is invented by Nick Holonyak and S. F. Bevacqua [4]. Logon et al. then developed the first green LED based on nitrogen doped GaP semiconductor p-n junction [7]. The colour and energy emitted by the LEDs depends on the energy band gap (E_g) of the semiconductor that is used to fabricate the LEDs. Semiconductor materials with an E_g of 2.0 eV or larger is essential to develop blue LEDs that can emit a wavelength range from 455 nm to 485 nm [4]. The wide band gap semiconductors that are used to develop blue LEDs should be of direct-transition type. High quality single crystal semiconductors with an E_g of above 2.6 eV are required to develop high brightness blue LEDs. The rapid improvement in the crystal quality of single crystal GaN semiconductor results in the development of high brightness blue LEDs. Zinc Selenide (ZnSe)

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Design and Implementation of Instantaneous Power Estimation Algorithm for Unified Power Conditioner	Sindhu S	ECE	Journal of Power Electronics	2019-2020	2093-4718	Web of Science



Journal of Power Electronics, Vol. 19, No. 3, pp. 815-828, May 2019 815

JPE 19-3-19

https://doi.org/10.6113/JPE.2019.19.3.815
ISSN(Print) 1598-2092 / ISSN(Online) 2093-4718

Design and Implementation of Instantaneous Power Estimation Algorithm for Unified Power Conditioner

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Abstract

This paper discusses a simple control approach for a Unified Power Conditioner (UPC) system to achieve power quality compensation at the point of common coupling in distribution systems. The proposed Instantaneous Power Estimation Algorithm (IPEA) for shunt and series active power filters uses a simple mathematical concept that reduces the complexity in the design of the controller. The performance of a UPC is verified with a system subjected to voltage distortions, sags/swells and unbalanced loads using MATLAB/SIMULINK. The simulation study shows that a UPC with the proposed control algorithm can effectively compensate for voltage and current harmonics, unbalance and reactive power. The control algorithm is experimentally implemented using dSPACE DS1104 and its effectiveness has been verified.

Key words: Harmonics, Point of common coupling, Power conditioner, Power quality, Series active power filter, Shunt active power filter

I. INTRODUCTION

Recently, there has been a surge in the current and voltage based power quality problems due to the wide use of power electronic converters and sensitive equipment in the commercial and industrial areas. The alarming rate of growth in controller using power electronic devices in such industries has resulted in power quality disturbances in distribution networks. High precision process industries and critical loads such as computers, microprocessors and medical equipment require an uninterrupted and regulated power supply of a rated magnitude and frequency. Power quality problems have an adverse effect on industries in terms of equipment failure, data loss, commercial loss and so on [1]. Therefore, standards such as IEEE 519-1992, 2014 have been developed to keep power quality within acceptable limits [2]. A number of mitigation techniques have evolved over time to meet these standards.

These mitigation techniques include passive filters, active filters, hybrid filters and custom power devices [3], [4]. Traditional passive filters using passive components provide only fixed compensation [5]. Active power filters [6]-[8] provide compensation for harmonics and introduce reactive components into systems so that power at a unity power factor can be drawn from the grid. Hybrid power filters [9] are a combination of more than one active filter or passive filter to solve the problems of reactive power and harmonics. Active power filters and hybrid power filters are capable of suppressing either voltage or current related power quality issues. The custom power park [10] concept was developed to provide high quality power to customers with critical loads that cannot tolerate variations in power quality levels. Custom power park with compensating custom power devices such as DVRs, static shunt compensators and unified power quality conditioners overcome power quality disturbances such as

Manuscript received Jul. 13, 2019; accepted Feb. 23, 2019.
Recommended for publication by Associate Editor Sreyas A. Akh.

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Early detection of breast malignancy using wavelet features and optimized classifier	Anoop V	ECE	International Journal of Imaging Systems and Technology	2019-2020	1098-1098	Web of Science

The screenshot shows the Wiley Online Library search results page. The search criteria are: 'INTERNATIONAL JOURNAL OF IMAGING SYSTEMS AND TECHNOLOGY'. The results show the journal's ISSN (1098-1098) and a list of articles. The article 'Early detection of breast malignancy using wavelet features and optimized classifier' by Anoop V is listed as a match.

The screenshot shows the Wiley Research Article page for the paper 'Early detection of breast malignancy using wavelet features and optimized classifier' by Jayesh George Melkonnappattu, Anoop Bahakrishnan Kadavil, and V Anoop. The page includes the abstract, keywords, and the introduction section.

Abstract: Breast cancer prevalence is a significant health issue among women. Early detection will ensure the treatment is easier and more successful. Recently, numerous methods have been developed using medical imaging to investigate breast cancer. This research work is to find a computer-aided diagnostic (CAD) system for benign, mammograms. The first stage of CAD, feature extraction, using a novel local binary pattern applied to a localized area in the initial stage of the CAD method, the extraction of the feature is used, and using these extracted feature function with classification level at 4 and at 10. SVM, SVM, and SVM classifier are used in the final stage to create accurate classification. The article proposes ISM with the Gradient Descent method Algorithm (ISM-GDA) to adjust the weight between the input and hidden layer to show maximum performance at the middle layer. This method adapts non-linear, non-convex, optimizes using regularization, second-order Hessian correction and gradient optimization algorithm based SVM to ameliorating the accuracy and reducing the computational cost. The result shows that ISM-GDA has precision and accuracy of 90% and 90% respectively. The CAD system can identify cancer with 90.33% sensitivity.

KEYWORDS: SVM, ISM-GDA, SVM, SVM, SVM, SVM.

1 | INTRODUCTION

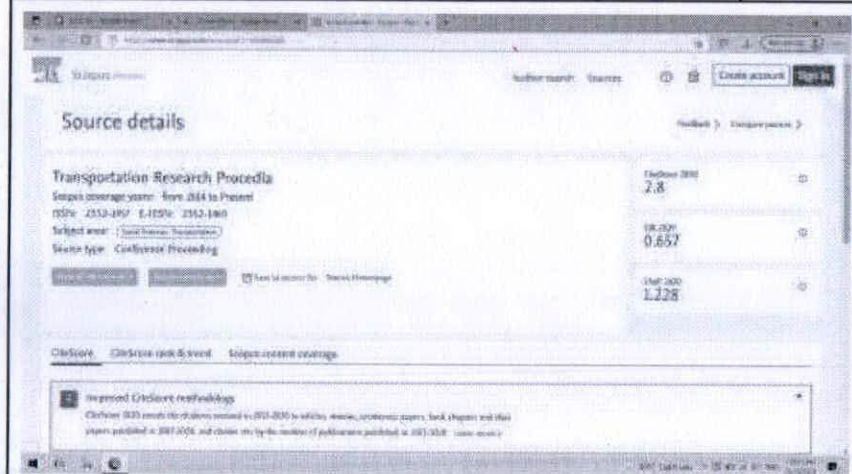
Signal and image processing algorithms have played a pivotal role in the area of cancer over the last few years.¹ The use of image processing methods in biomedical science is more important. Digital image processing algorithms perform an integral part of healthcare. Image processing is generally split into four main fields: image acquisition, image enhancement, image analysis and image reconstruction.² The integration of a robust image analysis and non-linear image processing algorithms is difficult as there is a disparity between the physician's discussion of a diagnostic image and the structure of the data which have an image to computer algorithms.³ Diagnosis of mammograms can be reported by diagnostic facilities with the growing rates of cancer cases of breast cancer. Due to complex conditions, there is a disparity between the availability of experts and the number of people required for mammogram examination. Furthermore, manual classification is tedious and vulnerable to error. It might lead to poor clinical results.⁴ Computer-aided diagnostic systems are necessary for diagnosis because of these limitations. Thus, above-mentioned challenges led to the research and design of a high-precision, computer-aided diagnostic system for breast malignancy diagnosis.

Mammogram images are taken by exposing the human breast area to X-rays. Mammography is a

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Effect of Geometry on Driver Heart Rate	Jisha Akkara	CE	Transportation Research Procedia	2019-2020	2352-1465	Scopus



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ScienceDirect
Transportation Research Procedia 48 (2020) 1125–1136

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World Conference on Transport Research – WCTR 2019, Mumbai, 26-30 May 2019

Effect of geometry on driver heart rate

Anitha Jacob^a, Jisha Akkara^a, Vineetha N^{a*}

^aJyothi Engineering College, Changanassery, Cheruvu, Kerala, India -679517

Abstract

Driving is a complex task incorporating most of the body organs and sensory system. Coordinated performance of eyes, ears, hands and legs are required in harmony with external or internal situations. Depending upon the stimulus the cardiac vascular performance of a driver varies. The objective of this paper is to model the heart rate kinetics of drivers in response to variation in highway curve geometry. The study was done on 114 horizontal curves of two lane rural highways of Kerala. Heart rates of 30 drivers were collected during their drive along the study stretches. Cross sectional details of curve like radius of curve, length of curve, deflection angle, super-elevation, width of road, width of shoulder and available sight distance were measured. Similarly the length of preceding tangent to the curve was also considered. Findings of the study revealed the correlation of sight distance and shoulder width with average heart rate. A nonlinear regression model was proposed based on analysis.

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Peer review under responsibility of the scientific committee of the World Conference on Transport Research – WCTR 2019.

Keywords: Heart rate, two-lane rural highways, geometry, driver workload

1. Introduction

Nomenclature

R	radius of horizontal curve in meters
CL	length of horizontal curve in meters
DA	deflection angle of horizontal curve in degrees
WR	width of road in meters
SE	super-elevation of horizontal curve
PTL	length of preceding tangent in meters

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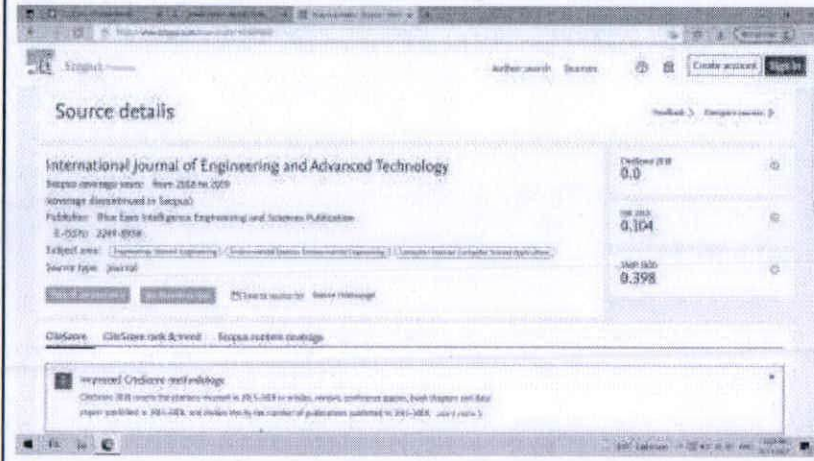
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Peer review under responsibility of the scientific committee of the World Conference on Transport Research – WCTR 2019.
10.1016/j.trpro.2020.05.051

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Feasibility Study of Provision for Exclusive Bus Lanes on Urban Roads	Vincy Verghese	CE	International Journal of Engineering and Advanced Technology (IJEAT)	2018-2019	2249-8958	Scopus



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International Journal of Engineering and Advanced Technology (IJEAT)
 ISSN: 2249-8958, Volume-8, Issue- 2C, December 2018

Feasibility Study of Provision for Exclusive Bus Lanes on Urban Roads

Arathi A R, Vincy Verghese

Abstract: Optimal use of road transport system is necessary to address the problem like traffic congestion, air pollution and safety. One such way to optimize it by encouraging use of public transport modes thereby by assigning priority to them. One of the bus preferential treatments is the provision of exclusive lanes for buses on urban roads. The specific aim of this study is mainly to study the feasibility of provision of exclusive bus lanes based on two criteria, based on proportion of travellers using different types of road vehicles and based on the total travellers' time savings in terms of money value due to provision of exclusive bus lane on urban road. The major work elements of this study include vehicle occupancy survey, vehicle volume and composition survey, income survey and estimation of journey time and journey time savings in terms of money value savings. The provision of exclusive bus lanes on urban roads increases the speed of buses, reduces journey time, lowers travel cost and reduces road crashes.

Index Terms: Exclusive Bus Lane, Money Value Savings, Vehicle Composition, Windshield Method.

I. INTRODUCTION

Transportation aims at safe and efficient movement of goods and passengers. Faster mobility of goods and passengers is the catalyst for economic growth of a country and this is facilitated by efficient transportation system. In case of road transportation systems, as facility increases, the volume of traffic also increases due to increasing demand for transport, particularly in developing countries like India. Because of the space, financial and material constraints urban road infrastructure cannot be developed beyond a limit and this leads to increase in congestion, pollution and reduction in road safety. Hence, there is a need for an appropriate strategy for optimal use of road transport system to reduce congestion and to increase efficiency of road networks. One way to reduce congestion is by encouraging the travellers to use public transport system (Buses) instead of private transport modes, because public transport system enables mass transit of passengers in fewer vehicles. To bring about a shift in the passenger preferences, the public transport system should be highly efficient and relatively less expensive to attract the travellers from private modes of transport. This goal can be achieved by encouraging public transport modes like buses by assigning priority. One of the methods of assigning priority to public transport are by providing exclusive bus lanes.

Exclusive bus lanes are the lanes restricted only for buses provided in order to speed up the buses, to reduce the interactions between buses and other modes of vehicles and thereby reducing the road crashes.

II. OBJECTIVES

By considering the aim of the study, the main objective formulated is to study the general impact of provision of exclusive bus lanes on traffic flow characteristics under heterogeneous traffic conditions. To achieve this main objective the sub-aims formulated was the following:

1. To develop social criteria based on the proportion of travellers using different modes.
2. To develop economic criteria based on the money value of time of travellers using the different modes.

III. LITERATURE REVIEW

Assan and Volghit [1] estimated the probable shift of car users to bus due to the increase in level of service (LOS) after providing exclusive bus lanes on Indian city roads carrying heterogeneous traffic. The increase in LOS was determined using a recently developed simulation model. A mode-choice probability curve to depict the possible modal shift of car users to bus was developed. From the curve, the probability of shift of car users to bus was estimated 0.71 at traffic flow corresponding to level of service C, for an 11 m wide road and 0.29 for 14.5 m wide road. Assan and Volghit [2] developed and used a heterogeneous traffic flow micro-simulation model to study the impact of provision of reserved bus lanes on urban roads in terms of reduction in speed of other categories of motor vehicles due to the consequent reduction in road space, over a wide range of traffic volume. It has been found that the maximum permissible volume-to-capacity ratio that will ensure a LOS C was 0.42 for the traffic volume other than buses if the bus lane is provided. Justifications of providing exclusive bus lane has also been defined on the basis of number of travellers per unit width of the road. Cervero [3] developed working paper on Bus Rapid Transit (BRT): An efficient and competitive mode of public transport. This report reviews experiences with designing and implementing BRT systems worldwide. BRT is first defined across a spectrum of service qualities and costs. The report closes with discussions on BRT's likely future given global growth projections and other pressing policy agendas in the foreseeable future. Chen et al. [4] carried out a study to examine the effect of exclusive bus lanes (EBLs) and transit signal priority (TSP) on bus rapid

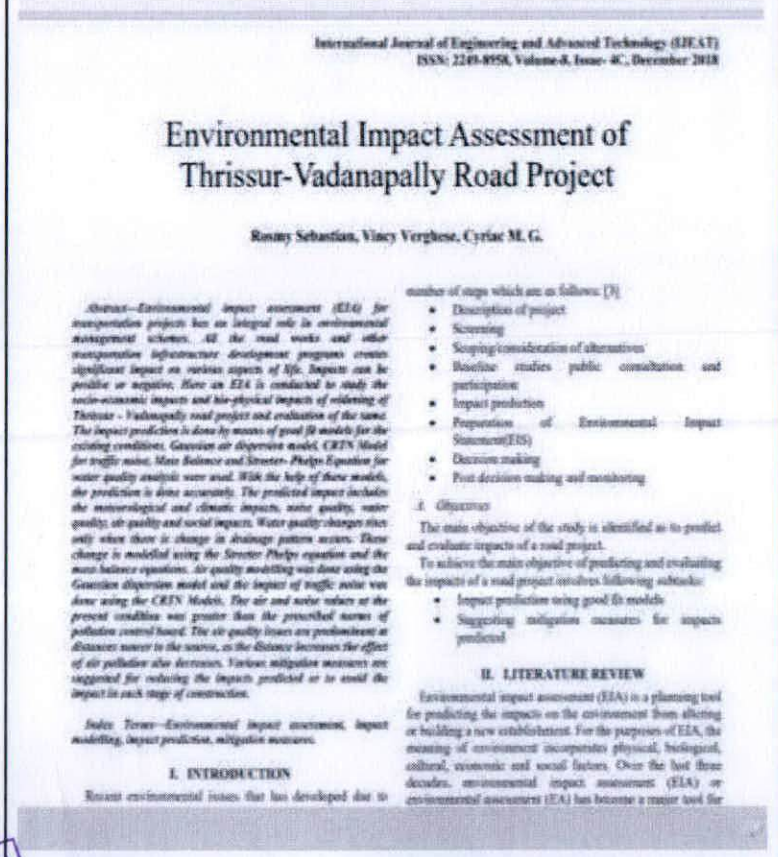
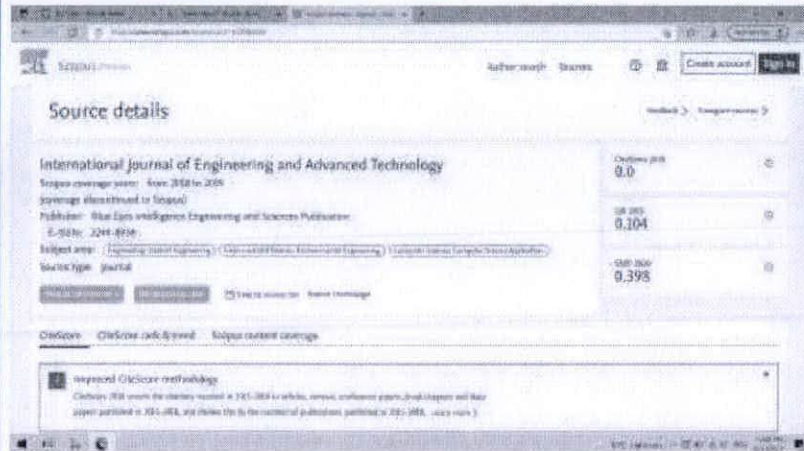
Received November 2018, Accepted February 2019
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Published By: Blue Sky Intelligence Engineering & Science Publications

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Environmental Impact Assessment of Thrissur-Vadanapally Road Project	Vincy Verghese	CE	International Journal of Engineering and Advanced Technology (IJEAT)	2018-2019	2249-8958	scopus



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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Use of Data Mining Technique for Systematic Road Safety Audit of Non-urban Highways	Dr.Anitha Jacob	CE	International Journal of Engineering and Advanced Technology (IJEAT)	2018-2019	2249-8958	scopus

The screenshot shows the Scopus database interface. The title of the paper is 'Use of Data Mining Technique for Systematic Road Safety Audit of Non-urban Highways'. The journal is 'International Journal of Engineering and Advanced Technology'. The Scopus coverage years are from 2018 to 2019. The publisher is 'Blue Eyes Intelligence Engineering and Sciences Publication'. The ISSN is 2249-8958. The subject area is 'Transportation, General Engineering'. The document type is 'Journal'. The citation metrics are: CiteScore 9.0, i10 Index 0.204, and H-Index 0.398. There is a 'CiteSpace' link for further details.

International Journal of Engineering and Advanced Technology (IJEAT)
ISSN: 2249-8958, Volume-8, Issue- 04, December 2018

Use of Data Mining Technique for Systematic Road Safety Audit of Non-urban Highways

Binoy R.J, Anitha Jacob

Abstract— In India the number of road crashes is rising at frightening rate. There is one death in every four minutes due to road crashes in India. Hence it is necessary to improve the road safety by conducting a detailed Road Safety Audit (RSA) in order to identify road safety issues and to make necessary improvements. Budgetary constraints limit many developing countries from performing the audit on regular basis. This will eventually delay any rehabilitation or repair process making the road conditions the worse and risky. This paper proposes a systematic approach to do the road safety audit on a highway and to do effective and efficient data mining, for deriving knowledge driven decisions in the classification of highway sections. The approach will help to perform safety evaluation of sections and to identify the crash potential locations. Further output of the work is the development of a mathematical model for classification of highway sections based on road safety audit.

Index Terms— Data mining, Wika, Road Safety Audit, Road safety audit

I. INTRODUCTION

Road Safety Audit (RSA) is a method of evaluating the safety performance of a road by an independent team or trained specialists. Qualitative information on potential road safety issues, identification of opportunities for improvements and ensure safety for all road users are the basic objectives of RSA. Government incorporate RSA into the initial stages of the project such as construction of new roads and intersections, and also encourage RSA on existing roads and intersections. Thoroughly all the new and reconstructed roads can be made safe as possible. Since RSA is done based on a check list-based procedure it can be used as one

Safety Authority (RSA) frequently check the safety improvements of the traffic control devices. Road Safety Audit can minimize the risk and severity of road accidents by the road project and also can minimize the need of remedial work after construction. Road safety inspection based on (IRC SP - 88, 2010) [9] is conducted on an existing road, from Kozhikode to Panangudi, since it is identified as one of the accident black spot.

II. LITERATURE REVIEW

This section describe a short survey about Road Safety Audit, and classification of road by means of Wika software and analysis.

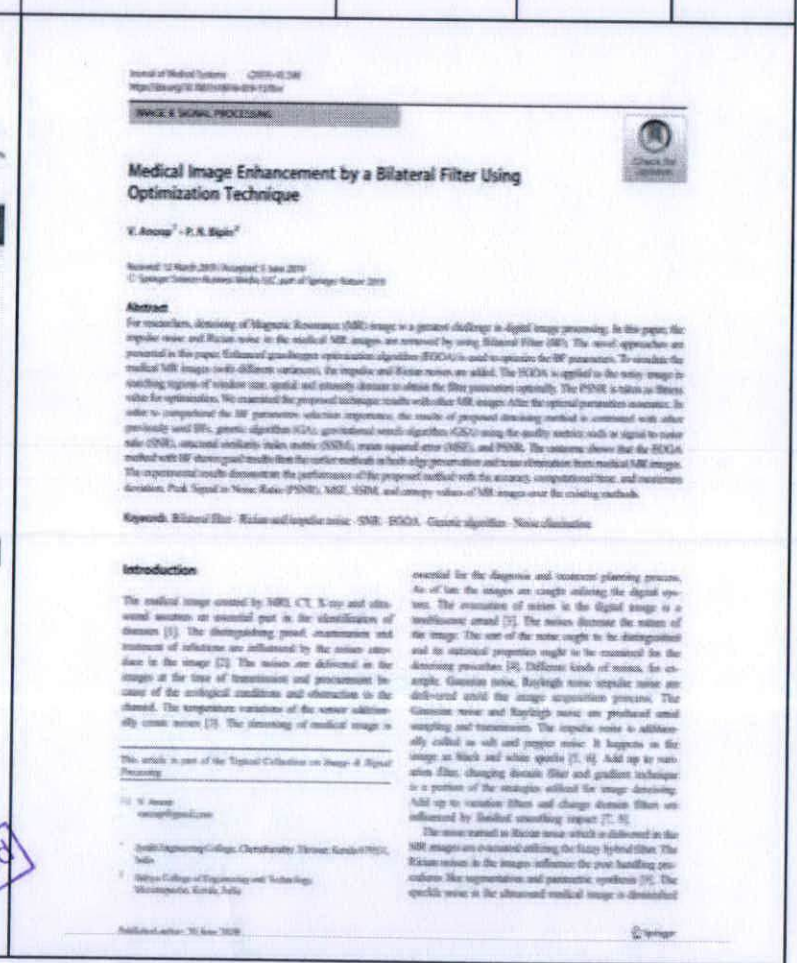
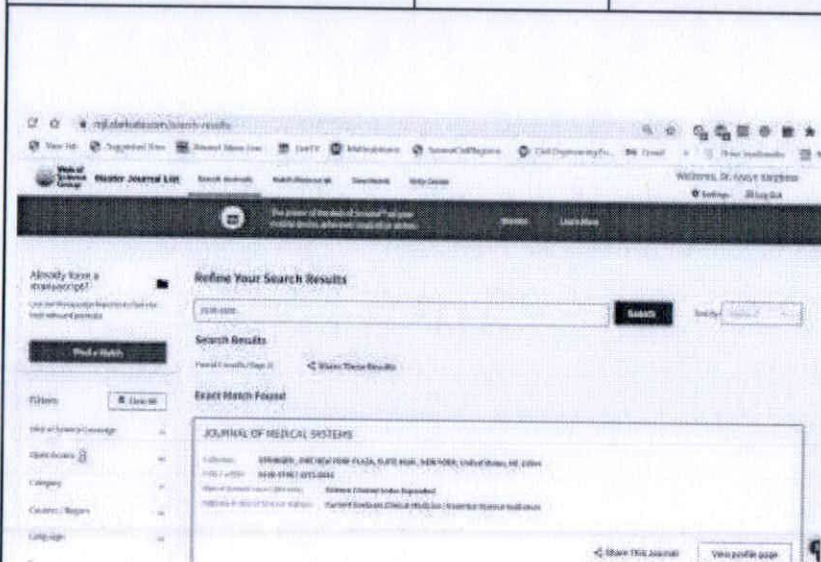
A. Road Safety Audit (RSA)

Road safety audit is done to ensure the operational safety performance of a road. Hence, it has the potential for improving safety when it is applied to a road or traffic design before the project is implemented. Through RSA the identification of potential safety hazards on new road projects at the appropriate stage can be done and so that it can minimize the adverse effects at minimum cost; it can be conducted on any design proposal, which involves changes to the ways road users will interact, either with each other or with their physical environment. Purpose of the audit is to identify hazardous features on existing road so that it can be eliminated or otherwise treated before they become an accident prone location. Miller and Agarwal [2] presented a systematic approach to improve the road safety by analyzing

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Medical image enhancement by a bilateral filter using optimization techniques, Journal of Medical Systems-Springer	Anoop V	ECE	Journal of Medical Systems	2018-2019	0148-5598	Web of Science



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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
"Investigation of RF and DC Performance of E-Mode In _{0.80} Ga _{0.20} As /InAs /In _{0.80} Ga _{0.20} As Channel Based DG-HEMTs for Future Submillimetre wave and THz Applications	Prajoon P	ECE	IETE Journal of Research	2018-2019	0377-2063	Web of Science

The screenshot shows the IETE Journal website interface. At the top, there's a navigation bar with 'Home' and 'About Us' links. Below that, a search bar is visible with the text 'Refine Your Search Results'. The search results section shows a list of articles, with the first one being the paper in question. The article title is 'Investigation of RF and DC Performance of E-Mode In_{0.80}Ga_{0.20}As /InAs /In_{0.80}Ga_{0.20}As Channel Based DG-HEMTs for Future Submillimetre Wave and THz Applications'. The author listed is 'Prajoon P'. The journal name is 'IETE JOURNAL OF RESEARCH'. The year of publication is '2018-2019'. The ISSN is '0377-2063'. There are also options to 'Show this journal' and 'View profile page'.

The cover page of the IETE Journal of Research, Volume 45, Issue 1, 2019. The title of the paper is 'Investigation of RF and DC Performance of E-Mode In_{0.80}Ga_{0.20}As/InAs/In_{0.80}Ga_{0.20}As Channel based DG-HEMTs for Future Submillimetre Wave and THz Applications'. The authors listed are J. Ajayan¹, T. Ravichandran¹, P. Mohankumar², P. Prajoon³, J. Charan Pradeep⁴ and D. Nirmal⁵. The journal is published by the Institution of Engineers (India). The cover also includes an abstract and a table of contents.

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Numerical analysis of circularly polarized modes in coreless photonic crystal fiber	Jarin T	EEE	Elsevier-Results in Physics	2018-2019	2211-3797	Web of Science

The screenshot shows the Elsevier search interface. The search term 'NUMERICAL ANALYSIS OF CIRCULARLY POLARIZED MODES IN CORELESS PHOTONIC CRYSTAL FIBER' is entered. The search results show an exact match in the journal 'RESULTS IN PHYSICS', Volume 11, Issue 1, pages 1-11, published in 2019. The authors listed are T.V. Ramaiah, A. Pandian, C. Elammai, T. Jarin, Ahmed Nabih Zaki Rasheed, and A. Sangeethakumar.

The screenshot shows the article page. The title is 'Numerical analysis of circularly polarized modes in coreless photonic crystal fiber'. The authors are T.V. Ramaiah^a, A. Pandian^b, C. Elammai^c, T. Jarin^d, Ahmed Nabih Zaki Rasheed^e, and A. Sangeethakumar^f. The abstract states: 'In this paper, the coreless photonic crystal fiber (CO-PCF) is investigated using finite element. The absence of core in the PCF structure is achieved by applying the permanent ferrite as its cladding boundary and hence the light propagation path tends to be circularly polarized. The other modes can also be formed other than the fundamental modes. It focuses on cladding WGM modes or super modes.' The introduction discusses the different construction of light propagation in fiber followed by the most behavior of light manipulation as related to polarization [1].

Wanji

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Exploring magnetic fluid sensor using dual circular core elliptical cladding photonic crystal fiber	Jarin T	EEE	Elsevier-Results in Physics	2018-2019	2211-3797	WEb of Science

The screenshot shows the Elsevier search results page. The search query is "Exploring magnetic fluid sensor using dual circular core elliptical cladding photonic crystal fiber". The results show one exact match found in the journal "Results in Physics". The article title is "Exploring magnetic fluid sensor using dual circular core elliptical cladding photonic crystal fiber" by Jarin T, et al. The search interface includes filters for publication year, language, and document type.

The cover page of the journal "Results in Physics" features the Elsevier logo and the journal title. The article title "Exploring magnetic fluid sensor using dual circular core elliptical cladding photonic crystal fiber" is prominently displayed, along with the authors' names: Nidal Abdulbaki, K. Vinoth Kumar, C. Karthika, T. Jarin, A. Gopi, and Afaf Bouaid.

Abstract:
 The work deals the sensing characteristics of magnetic fluid by various magnetic field strength (MF). The sensing mechanism is influenced in the given hollow circular hollow cladding of photonic crystal fiber (PCF) using dual core elliptical cladding (DCE). The light interaction between magnetic fluid and silica glass is numerically investigated by calculating the spectral shift of transmission wavelengths for 1000, 1200, 1400 and 1600 nm. The sensitivity of the proposed design is achieved.

Introduction:
 In modern optics, optical sensor has obtained more interest as it working over a wide range. Particularly, PCF is highly observed in proposed various kind of sensor such pressure sensor [1], temperature sensor [2], glucose sensor [3], waterborne pollen sensor [4], salinity sensor [5], blood glucose sensor [6]. In this work, photonic crystal fiber based magnetic fluid is investigated using DCE and its spectral shift studies the sensitivity of magnetic field strength (MF). The refractive index of magnetic fluid is taken from [7].

Design and numerical investigation:
 Fig. 1 shows the cross section view of the 2D magnetic fluid sensor.

The diagram shows a circular cross-section of the sensor. It consists of a central core surrounded by a cladding. The cladding is divided into three regions: an outer layer of Silica, a middle layer of Fluid, and an inner layer of Air. The core is a circular hole in the center.

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Evaluation of various benchmark processes with appropriate controller design in LabVIEW platform	Jarin T	EEE	Journal of Instrumentation	2018-2019	1748-0221	WEb of Science

Journal of Instrumentation

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R. Marry, M. S. Sathyanarayanan, T. Jarin¹ and S. R. Basu Prabhakar²

Published 30 May 2019 • © 2019 IOP Publishing Ltd and IOP Science

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Journal No: 11

Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Corrosion of reinforcement in concrete with fly ash and manufactured sand	Jarin T	EEE	Materials Research Innovations	2018-2019	1432-8917	Scopus

The screenshot shows the Scopus source details for 'Materials Research Innovations'. It lists the Scopus coverage years from 1997 to Present, the publisher Taylor & Francis, and the ISSN 1432-8917. The Scopus CiteScore is 3.1, the SJR is 0.283, and the QIP 2019 is 0.440. The source type is identified as a journal.

The screenshot shows the article page for 'Corrosion of reinforcement in concrete with fly ash and manufactured sand' on the tandfonline.com website. The article is by Jarin T. The abstract discusses the experimental study on the corrosion behavior of reinforced concrete structures with different types of aggregate (fly ash and manufactured sand) under different curing conditions. The abstract text is partially visible and reads: 'This research article reports the experimental study conducted on the investigation of corrosion mechanism. The study is made in four different types of concrete (plain concrete, concrete containing 10% of fly ash and concrete containing 20% of fly ash) and manufactured sand. The study reports the study under different curing conditions (7, 14, 28, 56, 90, 120, 150, 180, 210, 240, 270, 300, 330, 360, 390, 420, 450, 480, 510, 540, 570, 600, 630, 660, 690, 720, 750, 780, 810, 840, 870, 900, 930, 960, 990, 1020, 1050, 1080, 1110, 1140, 1170, 1200, 1230, 1260, 1290, 1320, 1350, 1380, 1410, 1440, 1470, 1500, 1530, 1560, 1590, 1620, 1650, 1680, 1710, 1740, 1770, 1800, 1830, 1860, 1890, 1920, 1950, 1980, 2010, 2040, 2070, 2100, 2130, 2160, 2190, 2220, 2250, 2280, 2310, 2340, 2370, 2400, 2430, 2460, 2490, 2520, 2550, 2580, 2610, 2640, 2670, 2700, 2730, 2760, 2790, 2820, 2850, 2880, 2910, 2940, 2970, 3000, 3030, 3060, 3090, 3120, 3150, 3180, 3210, 3240, 3270, 3300, 3330, 3360, 3390, 3420, 3450, 3480, 3510, 3540, 3570, 3600, 3630, 3660, 3690, 3720, 3750, 3780, 3810, 3840, 3870, 3900, 3930, 3960, 3990, 4020, 4050, 4080, 4110, 4140, 4170, 4200, 4230, 4260, 4290, 4320, 4350, 4380, 4410, 4440, 4470, 4500, 4530, 4560, 4590, 4620, 4650, 4680, 4710, 4740, 4770, 4800, 4830, 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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Energy and exergy analysis, drying kinetics, modelling and quality parameters of microwave - dried turmeric slices.	B. Deepanraj	ME	Journal of Thermal Analysis and Calorimetry	2018-2019	1588-2926	Web of Science

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A. Suresha, V. Srinivasan¹, D. Subramani & S. Srinivasan

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Abstract

The aim of this study was to evaluate the effect of curing and microwave power levels on energy analysis, drying characteristics, modeling and quality parameters of turmeric slices in microwave dryer. Drying experiments were carried out for fresh and cured turmeric slices. Four microwave power levels of 20%, 50%, 80% and 100% with the total output power of 900 W were used for this study. From the drying rate curve, it was observed that the drying process mainly takes place in the warming up and falling rate periods. Among the eight models evaluated in the study, Modlii et al. and Page model had a good agreement with the experimental data. Moisture diffusivity values increased (1.85×10^{-10} to 1.99×10^{-10} m² s⁻¹) as the microwave power level increases. From the energy analysis, it was found that specific moisture extraction rate and specific energy consumption values varied in the range of 0.246–

Signature

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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
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Deepanraj B., Deepanraj B.M., Deepanraj B.M., Deepanraj B.M.

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Abstract

Depletion of fossil fuel resources and continuous release of greenhouse gases to the environment forces the researchers to develop alternative fuel technologies that are environmentally more acceptable. Trans-esterified vegetable oil derivatives also called 'biodiesel' appear to be the most convenient method of obtaining low-cost vegetable oils or replacement fuels in diesel engines. In the present study, biodiesel was prepared from non-edible rapeseed oil through the trans-esterification process and the property of biodiesel was compared with standard diesel fuel. The optimal ratios of vegetable oils were well with the existing engine hardware and do not require noticeable modification. Experiments were carried out to analyse the performance, combustion and emission characteristics of a four stroke, single cylinder 495cc, direct injection, diesel engine fuelled with diesel, rapeseed oil biodiesel and diesel-biodiesel blends at a constant injection pressure of 300bar. The performance parameters such as brake thermal efficiency, brake specific energy consumption, exhaust gas temperature and combustion characteristics were studied.

Amal G

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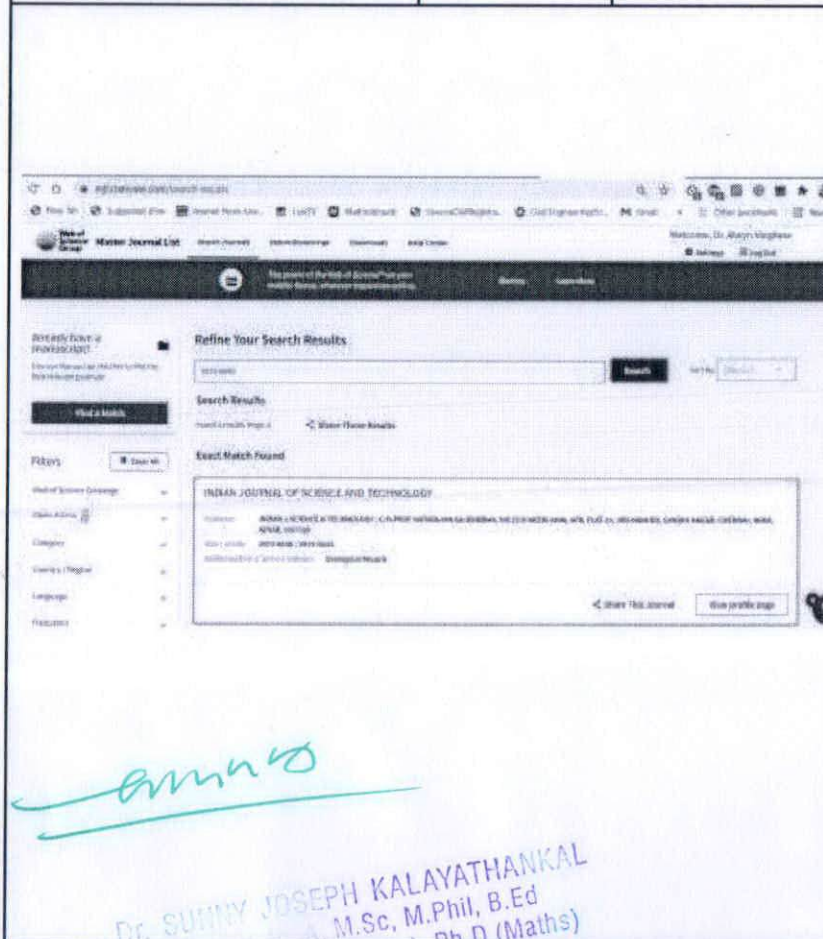
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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Low cost wireless telemetry system for deep brain stimulation	Jarin T	EEE	International journal of scientific research and review	2017-18	0974-5645	Web of Science



International Journal of Scientific Research and Review ISSN No: 2278-443X

LOW-COST WIRELESS TELEMETRY SYSTEM FOR DEEP BRAIN STIMULATION

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Abstract: In this paper, a custom circuit simulator is developed for Deep Brain Stimulation studies based on Brain-Computer Interface System. The system can deliver the precise amount of current pulses, and the feedback path ensures the system is reliable. The system has a size of 25mm x 15mm and weight of 8.5 grams including the battery which is a perfect cable in animal models. The main features of this system is a low powered processor, long life of two months, low cost, precision and the compact size. In vivo results proved that the system is suitable to use in animal models.

Keywords: Deep Brain Stimulation, Current, Pulses, Intracranial Self Stimulation

1. INTRODUCTION

Deep Brain Stimulation (DBS) is becoming a promising solution for treating Neuropsychological disorders. In many countries, this treatment is an approved and useful therapy for many patients. As the technology acquires a prominent space in our daily life, there is a new perspective to look into this treatment. Brain-Computer Interface is such a type of approach that studies to explore these fields. One of the applications of this technology is in the area of DBS. Studying the animal model using DBS is the most important factor since it is intended to apply in human models [1].

DBS has a history of more than 50 years. So it took a long way to emerge as present [2]. An old way of DBS was using cable connections between the equipment and the subject. There were a lot of issues using cables connections about cable entanglement and breaking of the cables [3]. As a solution to all these, different types of wireless stimulators were introduced. There were many drawbacks related to size, precision, software and lifetime for these wireless stimulators. Though stimulators are available commercially, they are all expensive in nature and so customers are not interested to have this product [4]. In the view of all these factors, we are developing and modelling a new stimulator system that overcomes the limitation of size, weight, precision and lifetime.

2. METHOD

The new wireless stimulator consists of a base station, system and backpack. Here the system can be either a computer or a mobile. This system will be serving as the main controller to the base station and the backpack.

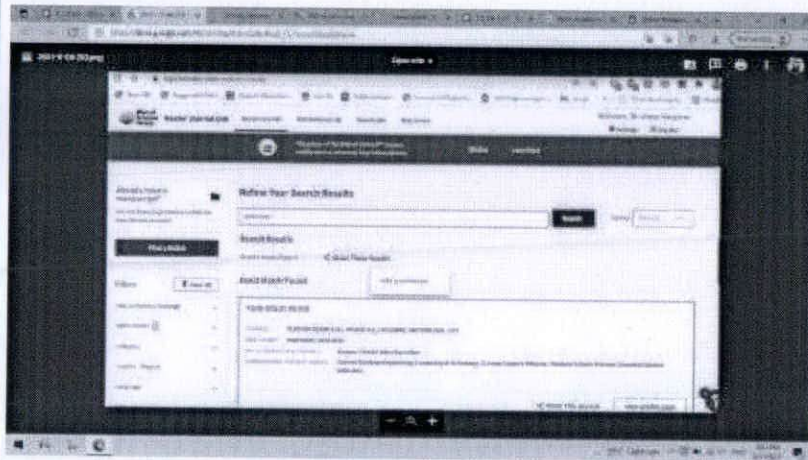
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Title of paper	Name of author/s	Department	Name of journal	Year of publication	ISBN/ISSN	Index
Tuning characteristics of Co3O4 nanofiber mats developed for electrochemical sensing of glucose and H2O2	Gibin George	ME	Thin Solid Films	2016-2017	0040-6090	Web of Science



Accepted Manuscript

Tuning Characteristics of Co₃O₄ Nanofiber Mats Developed for Electrochemical Sensing of Glucose and H₂O₂

Gibin George S. Anandhan

PII: S0040-6090(16)30400-4
 DOI: 10.1016/j.tsf.2016.05.019
 Reference: TSP 35108

Keywords: Thin Solid Films

Received date: 4 April 2016
 Revised date: 1 May 2016
 Accepted date: 3 May 2016

Please cite this article as: Gibin George S. Anandhan, Tuning Characteristics of Co₃O₄ Nanofiber Mats Developed for Electrochemical Sensing of Glucose and H₂O₂, Thin Solid Films (2016), doi: 10.1016/j.tsf.2016.05.019

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