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Research Article


The effect of copper oxide nanoparticle additives on the rheological and tribological properties of engine oil

Harsh Gupta, Santosh Kumar Rai, Nippani Satya Krishna & Gagan Anand  

Pages 622-632 | Received 20 Mar 2020, Accepted 12 Oct 2020, Published online: 20 Jan 2021

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 <https://doi.org/10.1080/01932691.2020.1844017>


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
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Abstract

The rheological and tribological properties of 0.5%, 1.0%, 1.5% and 2% CuO nanoparticles by weight blended in engine oil were studied. Surfactants were used to ensure maximum possible dispersion of the nanoparticles in engine oil. Samples were tested for viscosity, stress, torque and shear rate to be compared with data for just engine oil. Characterization of the Copper Oxide nanoparticles was done using an XRD, FTIR, photoluminescence, UV-Vis spectroscopy and Particle Size Analyzer.

Overall, nanoparticle additives seem to result in lower viscosity and lower torque.

There was also a force of friction and wear test done on a pin-on-disk machine for

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Conference Paper

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IOT SENSORS: A KEY ELEMENT TO CHANGE THE FUTURE OF STRUCTURAL HEALTH MONITORING

January 2021

Conference: THE INTERNATIONAL CONFERENCE ON FUTURISTIC TECHNOLOGIES 2021 - At: IIT DELHI

Project: IOT SENSORS: A KEY ELEMENT TO CHANGE THE FUTURE OF STRUCTURAL HEALTH MONITORING

Authors:

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National Institute of Technology (NIT) Uttarakhand

**Kranti Jain**

National Institute of Technology Uttarakhand, India

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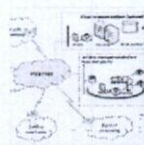


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Abstract and Figures

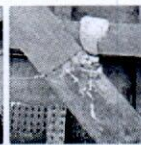
Structural health monitoring (SHM) is one of the modern and innovative methods adopted for monitoring integrity, structural safety and performance analysis without affecting the structure itself. The effectiveness of the IOT sensor in relates to Structural health monitoring is presented here. Wireless Sensor Networks (WSN) have largely preferred due to their prominent characteristics for structural Health Monitoring like flexibility, deployability, cost-effectiveness and lightweight. However, in most of the monitoring system, the traditional usages of wireless sensor networks are recorded with low power consumption, small data size, low duty cycle and low data rate. The Structural Health Monitoring system also needs stability measurement, real-time-synchronization, large data size, high data rate, and comparatively high Sampling data rate. This presented study outlined the synchronization need of wireless and represents how the network aggregation capacity and clock-drift and measurement stability is resolved.



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Characterization and experimental investigation of rheological behavior of oxide nanolubricants

Harsh Gupta, Santosh Kumar Rai, Piyush Kuchhal & Gagan Anand

Pages 651-656 | Published online: 07 Aug 2020

 Download citation <https://doi.org/10.1080/02726351.2020.1792018>

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Abstract

Nanolubricants are nano fluid, colloidal nanoparticle suspension, which are specially used for machine lubrication of the engine. Nanolubricants exhibit special tribological properties that have potential applications in mainly automotive industries. Performance of an engine is a function of the lubricant being used. A study of rheological behaviors of nanolubricants has been beneficial in understanding the influence of nanolubricants on shear rate and shear stress. This study is concerned with characterization and rheological behavioral studies of five nanolubricants. i.e., SnO_2 , TiO_2 , Fe_2O_3 , CuO and ZnO mixed with engine oil at 1%

Proceedings of the Institution of Mechanical Engineers, Part L: Journal of Materials: Design and Applications

Optimizing the performance parameters of injection-molded polymer spur gears

Prashant Kumar Singh, Akant Kumar Singh , Siddhartha, Prabir Sarkar

First Published December 3, 2020 | Research Article

<https://doi.org/10.1177/1464420720977561>




Abstract

This research focuses on the optimization of the performance parameters namely, surface temperature, wear rate, and transmission efficiency of polymer gears. Three different polymers namely, acrylonitrile butadiene styrene, high-density polyethylene, and polyoxymethylene are selected for manufacturing the gears. A total of 27 experiments are carried out to test these gears at different torque and speed conditions. The torque values are taken as 0.8, 1.2, and 1.6 Nm, whereas the speeds of 600, 900, and 1200 r/min are chosen for the study. The optimal setting of operating parameters (gear material, speed, and torque) is obtained by using a hybrid multi-criteria decision-making approach that includes the analytical hierarchy process and technique for order of preference by similarity to ideal solution. The optimal setting of performance parameters is obtained with polyoxymethylene gear running at the torque and speed conditions of 0.8 Nm and 900 r/min, respectively.

Keywords

Polymer gear, optimization, injection molding, transmission efficiency, AHP-TOPSIS

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CFD and thermo-hydraulic analysis of multiple arc roughened absorber plate with gaps used in solar air heaters

Navneet Kumar Pandey ✉, V. K. Bajpai, Abhishek Sharma & Sanjay Yadav

Received 02 Sep 2019, Accepted 12 Sep 2020, Accepted author version posted online: 16 Sep 2020, Published online: 28 Sep 2020

Download citation <https://doi.org/10.1080/01430750.2020.1824941>

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ABSTRACT

Repeated rib elements are used as roughness medium to increase heat transfer. An experimental and numerical analysis has been performed to study the influence of number of gaps on absorber plates pasted with arc-shaped roughness elements with gaps to study the heat transfer (Nu) and friction factor (f) used in solar air heaters (SAHs). ANSYS was used to simulate the air flow through a rectangular passage. A heating source of 1000 W/m^2 was provided on the top of the surface to simulate the radiant energy of the sun. Twenty seven combinations of roughened duct were investigated using the software as well as on an experimental set-up. The

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A Novel Scheme for Industrial Safety and Security with GSM

Ankit Kumar Rai^{1*}, M. A. Ansari¹, Pragati Tripathi and Astha Sharma, Aruna Pathak, Monika Jain

Abstract

In this paper, we tried to upsurge the level of safety and security system by conjoining new techniques and added new perceptions to develop low cost GSM based industrial safety and security system. In industries, safety, security and automation is a principal concern. Industrial automation, safety and security system design is developing these days. The designing of this safety & security system is simple hardware circuit. It allows every user to use this wireless security system by combining PIR motion sensor, smoke sensor, fire/flame sensor, IR sensor, laser sensor, temperature sensor and other failure detector at industrial level.

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Published
2020-07-01

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Section
Articles



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Article

Detection of Seizure Event and Its Onset/Offset Using Orthonormal Triadic Wavelet Based Features

December 2018 · IRBM

DOI:10.1016/j.irbm.2018.12.002

Authors:

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Chandigarh University**Omar Farooq**
Aligarh Muslim University**Yusuf Uzzaman Khan**
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Abstract

Background: Epileptic seizures are unpredictable in nature and its quick detection is important for immediate treatment of patients. In last few decades researchers have proposed different algorithms for onset and offset detection of seizure using Electroencephalogram (EEG) signals. **Methods:** In this paper, a combined approach for onset and offset detection is proposed using Triadic wavelet decomposition based features. Standard deviation, variance and higher order moments, extracted as significant features to represent different EEG activities. Classification between seizure and non-seizure EEG was carried out using linear discriminant analysis (LDA) and k-nearest neighbour (KNN) classifiers. The method was tested using two benchmark EEG datasets in the field of seizure detection. CHBMIT EEG dataset was used for evaluating the performance of proposed seizure onset and offset detection method. Further for testing the robustness of the algorithm, the effect of the signal-to-noise ratio on the detection accuracy has been also investigated using Bonn University EEG dataset. **Results:** The seizure onset and offset detection method yielded classification accuracy, specificity and sensitivity of 99.45%, 99.62% and 98.36% respectively with 6.3 s onset and -1.17 s offset latency using KNN classifier. The seizure detection method using Bonn University EEG dataset got classification accuracy of 92% when SNR = 5 dB, 94% when SNR = 10 dB, and 96% when SNR = 20 dB, while it also yielded 96% accuracy for noiseless EEG. **Conclusion:** The present study focuses on detection of seizure onset and offset rather than only seizure detection. The major contribution of this work is that the novel triadic wavelet transform based method is developed for the analysis of EEG signals. The results show improvement over other existing dyadic wavelet based Triadic techniques.

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Attacks in Underwater Sensor Network

¹Suresh Wati (PhD Scholar), ² Nitin Rakesh, ³ Parma Nand Astya, ⁴ Dr. Ashish Kumar

^{1,2,3} Department of Computer Science & Engineering School of Engineering Sharda University

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ABSTRACT

UWSNs are discovered to an advanced class of security malicious attacks. In this paper we explain two types of attack active and passive attack and explain which attack is more prominent in underwater sensor network. In during research deliberation has not taken security in UWSNs. WSN security cannot be direct use in UWSNs. Due to acoustic channel, incalculable environment and other communication issues in UWSNs. In this paper we explain all types of attack in UWSNs. UWSNs are unsafe to various attacks and solution of these attacks should be discussed. Some uniqueness and attacks of UWSNs and underwater acoustic channels are presented and discussed in detail.

Keywords - Underwater, Environments, Active Attacks, Passive Attacks, Security.

1. INTRODUCTION

In underwater different types of attacks, threats and vulnerabilities present to corrupt and break the underwater nodes security. These attack that compromise the security of the underwater nodes. The security attacks can be classified into two types there are active and passive attacks where the attacker gains illegal access to the underwater acoustic channel resources. In active attacks the attacker cut off the connection and convert the information, while in passive attack the attacker motive of reading and analyzing and convert the transmit information not for altering it is the big difference within active and passive attacks.

2. COMPARISON OF PASSIVE AND ACTIVE ATTACKS

Comparison Based	Active Attacks	Passive Attacks
Basic	In active attack the attacker can cut off the connection and convert the information, underwater acoustic channel resources or affect their operation.	In passive attack the attacker motive of reading, analyzing and convert the transmit information. It does not altering and do not affect the system resources.
Information modification	Occurs	Does not take place. It can't modify any information.
Nodes harmful	Always causes damage to the nodes.	Do not cause any harm.
Threat to	Availability and Integrity	Reliability
Attack awareness	When attack occurs the entity gets informed	The entity does not get informed.
The attacker perform task	The transmission is captured by physically controlling the portion of the link	Just need to observe the transmission
Emphasis is on	Detection	Prevention

3. ACTIVE ATTACKS

The active attacks the attacker cut off the connection and convert the information, while in passive attack the attacker motive of reading and analyzing and convert the transmit information attacks in which the attacker tries to modify the information or creates a false message. A broad range of software vulnerabilities, potential physical and network the prevention of active attacks is quite difficult. But prevention, it emphasizes on the detection of the attack and recovery from any disruption or delay caused by it. An active attack mostly requires more dangerous implication and more effort. When the hacker attempts to attack, the victim gets aware of it. Shown in fig.1

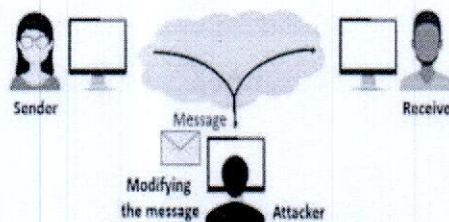


Fig. 1 Active attacks

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Conference Paper

Data communication Issues in Underwater Sensor Network

October 2019

DOI: [10.1109/ICCIS48478.2019.8974476](https://doi.org/10.1109/ICCIS48478.2019.8974476)

Conference: 2019 International Conference on Computing, Communication, and Intelligent Systems (ICCIS)

Authors:



Suresh Wati

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... In addition, it may be caused by various refracted rays. All these factors give rise to high rates of error in data transmission [14, 15]. • Constrained Energy: One of the major challenges when deploying underwater sensor networks is the limitation of energy resources of the sensor nodes. ...

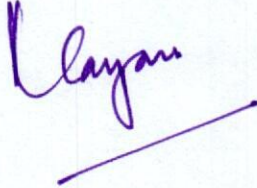
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Impact of Workplace Happiness on Employee Engagement: A Comparative Study of IT & Non-IT sector employee

by Sana Vakeel, Sunita Shukla, Vikas Singh

Abstract: Being happy at workplace is all about enjoying what employees do and admire where they work. Workplace happiness is not only for the employee, but also for the organization one works for. Since employees spend much of their lives at the workplace, it is important to study the impact of workplace happiness on various factors such as job satisfaction, employee engagement and effective organizational communication. The study aims to explore the impact of workplace happiness on employee engagement for employees working in the IT and non-IT sectors in Delhi-NCR. The study found that 22.7% of the variation in the employee engagement is explained by workplace happiness. The impact of workplace happiness on employee engagement was found to be almost similar in IT and Non-IT sector employees. The study uses Karl Pearson's correlation and regression analysis.

Keywords: Workplace Happiness; Employee Engagement; Job Satisfaction; Information Technology.


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A STUDY ON SERVICE QUALITY GAPS IN INDIAN BANKS USING SERVQUAL MODEL IN DELHI/NCR

June 2020

Authors:

**Rashmi Kaushik**
ITS Engineering College**Sana Vakeel**
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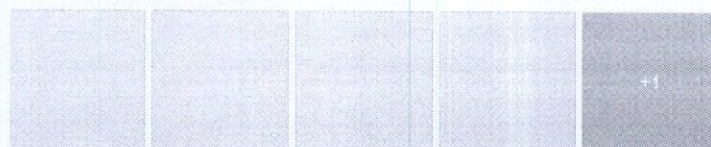


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Abstract and Figures

Economic significance of services sector in India has been increasing considerably. The services sector has been the major contributor to India's GDP over the past few decades. It contributed around 49% to the country's GDP in the year 2018, up from 15% in 1950. The services sector grew at 7.5% in the post-liberalisation era (1991-2000), compared with a growth rate of 4.5% in the pre-liberalisation regime i.e. 1951-80. It provided employment to about 31% of workforce in 2018. The banking sector has played a vital role in the economic development of India. Presently, the sector is fairly vast in terms of product range, supply and reach. In comparison to other banks located in their region, Indian banks generally have strong and transparent balance sheets with lesser bad debts. Meeting customer expectations is one of the major challenges currently faced by private and public sector banks in the country. That is why service quality in a key concern for the banking sector strategists. This paper attempts to measure the level of service quality offered by banks situated in the Delhi/NCR region. The empirical research uses primary data collected from retail customers of various banks through developing a questionnaire based on SERVQUAL model given by Parasuraman et al (1988). This paper also includes a comparative analysis of service quality levels offered by public and private sector banks. The research would help in finding out quality gap in services offered by banks using GAPS Model, while identifying areas of improvement in Indian banks. INTRODUCTION The banking sector in India has experienced a lot changes in its functioning and structure after the liberalisation of the country in 1991. The competition in the sector has intensified a lot with the entry of a lot category of banks in the industry. There are a total of 182 banks, including 18 nationalised banks, 42 private sector banks, 33 state cooperative banks, 45 regional rural banks and 44 foreign banks operating in the country (RBI). Banks have been involved in developing customer-centric strategies for gaining sustainable competitive advantage. To grow and survive in the competitive environment, it is significant for banks to offer quality service to their customers. Studies suggest that offering quality service not only helps in generating customer satisfaction, but also a plays key role in acquiring new customers as well as retaining existing customer with the organisation. Numerous studies indicate that improving service quality also helps in generating positive word of mouth, enhancing corporate image, reducing costs and increasing profitability (Kang & James, 2004; Kumar et al., 2010).

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A Novel Scheme for Medical Image Compression using Huffman and DCT with Water Marking

Ankit Kumar Chaudhary^{1*}, M.A. Ansari¹, Aruna Pathak², Monika Jain³, Pragati Tripathi¹
and Rajat Mehrotra¹

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Abstract

Image compression is one of the data compression applications in which we convert the original data into a few bits. In image compression we can simply preserve the data needed by removing unwanted data to be proficient to record or refer data in a functioning form. Hence the image compression reduces the communication time and increases the communication speed. We mainly use lossy & lossless techniques to remove this type of problem. There is no data loss when we compress images with a lossless image compression technique while some of the unnecessary data losses in lossy image compression technique. By using these processes, we can reduce the data size, which we can save more data in less memory. Here we have done the uses of Huffman & DCT techniques for image compression. In order to analysis medical image we have used the DWT feature extraction technique. Here for security we have done watermarking tool in medical image.

Keywords-Image Compression, Lossy & Lossless techniques, Huffman & DCT coding, DWT feature extraction technique and Watermarking.

I. INTRODUCTION

Image compression is an application of data compression in which we convert the original image to some bits. With the help of image compression, we compress the medical image to facilitate transfer of this from one place to another [1]. In image compression we can reduce the dimensions of the original data to reduce the size of the original data. When we compress a medical image, our purpose is to make sure that none of the original image is the lost of the required data. Compression techniques are technically advanced to allow large files to be compressed easily. By quick improvement in a suitable way via impressive procedures a huge scope of image data ought to store those images typically outcomes in the compressing images. There are some algorithms used to complete these. Types of compression in several actions such as lossless and lossy. The image that needs to be compressed to a pixel range of grayscale, ranging from 0 to 255. While compressing any data it must be kept in mind that any data required will not be lost in the body [2]. Also, low bits are needed in saving data in digital media and sending. Compression to some range shows that there is a section of data whose size is required to decrease. Now this JPEG format is absolute option for digital image. The Joint Photographic Expert Group (JPEG) which depends on discrete cosine transform (DCT) is a very extensively second choice formula for compression. Image compression is one of the incredible familiar way in image operation. In this way we can have many basis ideas and play a significant role in the actual storage and transmission of images. In image compression, in the proposed model to reduce unnecessary data we will use less sample to facilitate sending and saving of this. The main goal of reducing the number of bits per large base to compress images is to decrease the transmission time to display this image and broadcast the image and regenerate once again by Huffman encoding [3].



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Volume 40, Issue 2, March 2019, P.

Original Article

Detection of Seizure Event and Its Onset/Offset Using Orthonormal Triadic Wavelet Based Features

G. Chandel ^a, P. Upadhyaya ^b, O. Farooq ^c, Y.U. Khan ^d

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<https://doi.org/10.1016/j.irbm.2018.12.002>

Highlights

- The use of *triadic* wavelet based features for seizure detection.
- Long-term EEG signals were analysed.
- The method obtained 99.45% of accuracy and 98.3% of specificity.
- The efficiency compared with existing convention.

Abstract

Background

Epileptic seizures are unpredictable in nature and its quick treatment of patients. In last few decades researchers have focused on onset and offset detection of seizure using Electroencephalography (EEG) signals.

Methods

In this paper, a combined approach for onset and offset detection of seizure using wavelet decomposition based features. Standard deviation of wavelet coefficients is extracted as significant features to represent different EEG signals.

G. Chandel

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CFD and thermo-hydraulic analysis of multiple arc roughened absorber plate with gaps used in solar air heaters

Navneet Kumar Pandey ✉, V. K. Bajpai, Abhishek Sharma & Sanjay Yadav

Received 02 Sep 2019, Accepted 12 Sep 2020, Accepted author version posted online: 16 Sep 2020, Published online: 28 Sep 2020

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ABSTRACT

Repeated rib elements are used as roughness medium to increase heat transfer. An experimental and numerical analysis has been performed to study the influence of

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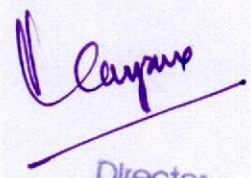
Published: 19 June 2020

Chromatic Dispersion Induced Semi Optical Pulse Stretching Approach to Beam Steering Applications of Phase Array Antenna

Chandan Kumar  & Sanjeev Kumar Raghuwanshi*Wireless Personal Communications* **115**, 949–960 (2020)71 Accesses | [Metrics](#)

Abstract

A semi optical technique based on chromatic dispersion induced pulse stretching effect of single mode optical fiber has been utilized to demonstrate the beam steering of phase array antenna. In the proposed study 1×4 antenna array has been fabricated at desired specifications before applying the photonic feeding concept. In the beginning of the paper detail, fabrication process of antenna array has been demonstrated followed with establishing relationships between the phase shifts introduced between two consecutive antenna elements. The purpose of this paper is to design and fabricate a novel Rectangular Microstrip antenna array. The Resonant frequency of antenna is 13 GHz. The proposed rectangular patch antenna has been designed using FR4 with dielectric constant ($\epsilon_r = 4.4$), loss tangent ($\tan\delta$) equal to 0.02. The individual


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Characterization and experimental investigation of rheological behavior of oxide nanolubricants

Harsh Gupta, Santosh Kumar Rai, Piyush Kuchhal & Gagan Anand

Published online: 07 Aug 2020

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Abstract

Nanolubricants are nano fluid, colloidal nanoparticle suspension, which are specially used for machine lubrication of the engine. Nanolubricants exhibit special tribological properties that have potential applications in mainly automotive industries. Performance of an engine is a function of the lubricant being used. A study of rheological behaviors of nanolubricants has been beneficial in understanding the influence of nanolubricants on shear rate and shear stress. This study is concerned with characterization and rheological behavioral studies of five nanolubricants, i.e., SnO_2 , TiO_2 , Fe_3O_4 , CuO and ZnO mixed with engine oil at 1% volume by weight concentration. In this study, the result showed that the shear rate was independent of viscosity confirming the Newtonian behavior of these nanolubricants. Non-linear decrease in the shear viscosity, with the rise of the temperature, was observed as well

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Modified k-string in composition vector method for DNA sequence comparison based on maximum entropy principle

Kshatrapal Singh ✉, Ashish Kumar & Manoj Kumar Gupta

Pages 31-41 | Published online: 21 Apr 2020

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Abstract

The Composition Vector method is a type of alignment-free methods for sequence comparison. The proposed method is based on modified k-string method, which uses the ratio of frequencies of all possible sub-words of length k in a DNA sequence to compare two sequences. We have proposed a scheme based on modified formulas for sequence comparison considering principle of maximum entropy. There exist several formulas for the purpose however the one maximizing the entropy was selected for the study. It leads to a unified approach for sequence comparison. The obtained results have been analyzed and compared with existing composition vector and K-string methods by drawing phylogenetic trees. The results show that the proposed scheme performs better in comparison to existing methods.

Q Subject Classification: 60A99**Q Keywords:** DNA Alignment free sequence comparison k-string composition vector method

maximum entropy principle phylogenetics

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Mechanical and Fracture Peculiarities of Polypropylene-Based Functionally Graded Materials Manufactured via Injection Molding

A. K. Singh, Siddhartha and S. Yadav

<https://doi.org/10.3139/217.3784>

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A. K. Singh^{1*}, Siddhartha², S. Yadav¹

¹Department of Mechanical Engineering, I.T.S Engineering College, Greater Noida (UP), India

²Department of Mechanical Engineering, NIT Hamirpur (HP), India

Mechanical and Fracture Peculiarities of Polypropylene-Based Functionally Graded Materials Manufactured via Injection Molding

This research presents the investigation of mechanical and thermal characteristics as well as fracture toughness of Polypropylene (PP) based functionally graded materials (FGMs) and compares them vis-a-vis PP based homogeneous composites and neat PP. FGMs and homogeneous composites are fabricated with 15 wt.% and 30 wt.% glass fiber reinforced PP. The gradient of fiber distribution in functionally graded materials is verified by scanning electron microscope analysis and ignition loss test. Findings of this work reveal that FGMs outperform neat PP and homogeneous composites. Tensile, flexural and compression strength of FGMs are found to be better as compared to neat PP and homogeneous composites. Fracture toughness and thermal conductivity are also found higher for FGMs. The performance of fabricated composites is optimized by using the ViseKriterijuska Optimizacija i Komorismo Resenje (VIKOR) method.

1 Introduction

The inclination towards fabricating and assessing the potential of novel materials which may outperform conventional materials has increased vastly due to the pressing demands of recent advents in technology. Composite materials are examples of the first category. Composite materials are multi constituent in nature and the physical and mechanical properties of the matrix and the reinforcements can be suitably altered to meet the desired functionality for a particular application. Thermoplastic composites are most commonly used in the automobile industry due to their good impact strength, easy recyclability and fast processing time. Plastics have shown a higher annual growth rate as compared to steel and aluminum in the last

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Proceedings of the Institution of Mechanical Engineers, Part J: Journal of Engineering Tribology

Development and investigation on transmission efficiency of functionally graded material-based polybutylene terephthalate spur gears

Akant K Singh , Siddhartha

First Published November 7, 2019 Research Article

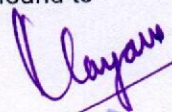
<https://doi.org/10.1177/1350650119886233>

Abstract

Application of polymer composite gears is increasing due to their superior properties. They have lower inertia, less weight, and run much quieter than their metal counterparts. In the present work, functionally graded material-based glass fiber reinforced polybutylene terephthalate gears are fabricated with a novel horizontal centrifugal casting technique using an injection molding machine. Conventional technique is used to fabricate homogeneous polybutylene terephthalate gears. Polybutylene terephthalate reinforced with 15 and 30 wt% glass fibers is used to fabricate gears. Unfilled polybutylene terephthalate gear is also manufactured for comparative study. Gradation in functionally graded material gear is verified by scanning electron microscope analysis, and Shore D hardness is measured in three different locations of the fabricated functionally graded material gears. Gradation in functionally graded material gear is also verified by ignition loss test method. Continuous gradation is observed in functionally graded material gear by scanning electron microscope and confirmed by hardness test and ignition loss test. The objective of present work is to investigate and compare the transmission efficiency of homogeneous and functionally graded material gears during operation. A polymer gear test rig is used for the experimental work. Experiments are conducted at various torque and speed combinations for 0.2 million cycles. Life span of fabricated gear is also tested for 10 million cycles. The range of the torque is 0.8–2.6 N m and the range for rotational speed is 500–1400 r/min. The transmission efficiency of the fabricated gears is found to be sensitive to the operating torque.

Keywords

Polybutylene terephthalate, glass fibers, injection molding, functionally graded material gear, scanning electron microscope, hardness, ignition loss test, transmission efficiency


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Materials Today: Proceedings
Volume 18, Part 7, 2019, Pages 4893-4900

Transmission Efficiency of Functionally Graded Material Based HDPE Spur Gears

Akant Kumar Singh ^a , Siddhartha ^b, Sanjay Yadav ^a, Prashant Kumar Singh ^b

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<https://doi.org/10.1016/j.matpr.2019.07.480>

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Abstract

Polymer gears are replacing the metal gears in various applications due to some of their inherent properties. Polymer gears have lower inertia, less weight and operate much quieter in comparison to metal gears. In this work, glass fiber reinforced functionally graded material based High-Density Polyethylene (HDPE) gears is fabricated using injection molding machine for the investigation of transmission efficiency. Glass fiber filled HDPE materials in the punch are rotated at 1800 rpm for 2 min. for the gradation of the fibers. Homogeneous and neat HDPE gears are also fabricated for comparative study. Polymer gears are running at different speed (600, 800, 1000 and 1200 rpm) and torque (0.8, 1.2, 1.6 and 2 Nm) to investigate the transmission efficiency. Gears are operated for 1.2×10^5 cycles. The experiments are carried out using a power absorption type polymer gear test rig. It is concluded from this work that transmission efficiency of these polymer gears is significantly affected by torque. Speed has less significant effect on transmission efficiency of polymer gears.

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Keywords

Polymer gears; Polymer gear test rig; DMA; Transmission efficiency

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Article

Mechanical peculiarity of nano BN filled polyester based homogeneous nanocomposites and their FGMs – A comparative study

February 2020 · *Materials Today: Proceedings* 25(10)

DOI:10.1016/j.matpr.2020.02.134

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**Sanjay Yadav**

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Abstract

The aim of this work is to find out the influence of nano BN (Boron Nitride) filler and fabrication technique on the mechanical properties of filler filled polyester composites. Nano BN filled polyester based homogeneous nanocomposites (HNC) and their functionally graded materials (FGMs) are fabricated using stirring and centrifugal casting technique, respectively. HNCs and FGMs are fabricated with the reinforcement of 5 wt% and 10 wt% of nano BN fillers respectively. Unfilled polyester is also fabricated for the performance comparison with HNC and FGMs. Result finding shows that hardness of nano BN filled FGMs is higher as compared to HNCs and unfilled polyester. Hardness increases with increase in the amount of nano BN filler for FGMs as well as HNCs. Same trend is also observed for flexural and compressive strength. However tensile strength increase with the addition of 5 wt% of nano BN filler and further decreases with 10 wt% for both, FGMs and HNCs.

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Energy Efficient Charging for Electric and Solar Assisted Vehicles

Pushpendra K. S.*, M. A. Ansari, N. S. Pal, Aruna Pathak, Monika Jain, Nivedita Singh

Abstract

The need of a battery charging facility has become protruding to alleviate the range anxiety problematic of electric vehicle (EV) drivers and solve the limited operation – electric drive range of the current EVs.

This paper presents a charging strategy for an EV battery which is reliable and robust for a Lithium ion

battery. Here, we have designed bi-directional charger in Matlab Simulink environment. The Changes in

on board converters applied to electric vehicles for better charging and also for finding the better way to

charge a lithium ion battery, on board circuit is designed for charging facilities for EV 's and solar assisted

vehicle so that there is only need of just plug into ac power source as used in various applications the

motive behind designing the charger is to make charging in an easier way so that it provides a positive

impact on the advancement of electric vehicles free of pollution in future.

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A Novel Scheme for Industrial Safety and Security with GSM

Ankit Kumar Rai^{1*}, M. A. Ansari¹, Pragati Tripathi and Astha Sharma, Aruna Pathak, Monika Jain

Abstract

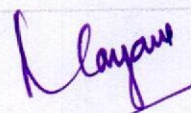
In this paper, we tried to upsurge the level of safety and security system by conjoining new techniques and added new perceptions to develop low cost GSM based industrial safety and security system. In industries, safety, security and automation is a principal concern. Industrial automation, safety and security system design is developing these days. The designing of this safety & security system is simple hardware circuit. It allows every user to use this wireless security system by combining PIR motion sensor, smoke sensor, fire/flare sensor, IR sensor, laser sensor, temperature sensor and other failure detector at industrial level.

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A Novel Approach for ECG Signal Analysis using LabVIEW Techniques

Shivam Pandey, M. A. Ansari, Nidhi Singh Pal, Aruna Pathak, Monika Jain, Astha Sharama, Pragati Tripathi

Abstract

Electrocardiogram (ECG) plays an enormous role in the medical field. An electrocardiograph is a device used in cardiology, which records heart's electrical signals over time. ECG can be used to determine various heart diseases or damages to the heart along with the pace at which the heart beats as well as the impacts of medications or gadgets used to control the heart. The interpretation of the ECG signals is an application of pattern recognition. The technique used in this project integrates the study of the ECG signals, extraction and denoising it. Different noises analyzed and removed by different methods using LabVIEW. Analysis of ECG signals is done using LabVIEW and bio medical workbench. The study includes investigation of ECG signal by LABVIEW, also plotting of ECG signals and comparison between different denoising techniques of ECG signal

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Novel Method of Secure Communication using Logistic Map

Supriya Khaitan, Rashi Agarwal, Mandeep Kaur

Abstract: Significant research efforts have been invested in recent years to export new concepts for secure cryptographic methods. Many mathematicians are attracted by Chaos functions as it has sensitive nature toward its initial conditions and their colossal suitability to problems in daily life. Inspired by new researches, a new chaotic cryptography algorithm is proposed in this paper. The key feature of this approach is that instantaneous key is generated at host independently that is used to determine the type of operations on each pixel. The information available in images is 24 bit RGB these value are modified mathematically using eight reversible operations. Also during encryption, the control parameter of the chaotic system is updated timely.

Index Terms: Chaotic Map, Encryption, Decryption, Security, Logistic Map.

I. INTRODUCTION

Chaos theory has been receiving enormous response in the last two decades by the scientific community. The logistic map is a dynamic population model that is non-linear in nature and was originally introduced by Pierre François Verhulst [5].

For distinct applications and the complexity of research done on various logistic map, anyone may refer to Ausloos [5], Bunde & Havlin [7], Crownover [8], Holmgren [10], Peitgen, Jurgens and Saupe [13] and [14].

The most promising application of chaotic maps in the area of cryptographic algorithms relies on the properties that chaotic are similar to noise and depends on initial parameters. Chaotic map fulfills the basic requirements of cryptography because of its sensitiveness towards the initial conditions. Therefore, the secret keys are usually the system parameters and initial conditions.

Many chaotic systems have been created so far. The highest acclaimed cryptosystems is formed on the ergodic property of chaotic maps. It has received lionized attentions in the past literature [1] - [4], [9], [11], [12], [22] and [23]. Pecora and Carroll showed application of chaos in masking the message for transmitting signals [12]. In 1998, Baptista

proposed a new cryptosystem [6] that encrypts the message into different iterations for chaotic map to purview a domain on a phase space that harmonize to the text.

Wong examined Baptista's approach and found some limitations like the dissipation of the cipher-text is not homogeneous. A random number sequence is generated for every block of text. After examining the drawbacks, a solution was proposed by Wong that gave a much deflated distribution of cipher-text using the same logistic map [22]. After that, scientists proposed a time efficient chaotic-cryptographic algorithm that uses a dynamical look-up table that updated continuously depending on the plaintext instead of static one [23].

Rani and kumar gave a new kind of iteration called superior iteration in analyzing, generating and studying the behavior of fractals and chaotic maps [18] - [21]. In 2009, Rani and Agarwal have increased the stability of logistic map using superior iterations in the map [15] and also generate beautiful fractals [16]. Also, the above same authors have shown superior fractals are more stable under high strength of dynamic noises as compared to classic fractals [17]. Many have used [24][25] a bit scrambling algorithms with chaos concept to change position of pixels.

Seeing the applications of chaos and fractals, we proposed a new encryption method based on it. This method is based on multiple, dynamic and one time usable keys generated from logistic map without involving the exchange of key.

In Section 2, we describe the iteration technique that we use in our proposed model using example. In Section 3, we have given the analysis and applications of the proposed model followed by Section 4 that presents the conclusions related to security and utility of the chaotic model.

II. PROPOSED METHODOLOGY

A. Chaos Theory

Chaos is a non deterministic method based on non linear system. It focuses on behavior of dynamic systems; those are highly sensitive to initial condition.

Mathematically, the extensively simple looking one-dimensional logistic map is given by the equation

$$x_{n+1} = r * x_n (1 - x_n), \quad (1)$$

Where x_n is any value between 0 and 1 and it represents the population for a particular year n. Therefore, x_0 epitomize the initial population and r speaks to a positive joined rate for proliferation and starvation [5] and [8].

Revised Manuscript Received on July 5, 2019.

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Journal of Thermoplastic Composite Materials

An investigation on the mechanical and thermal performance of a novel functionally graded materials–based thermoplastic compositesAkant Kumar Singh^{1D}, Siddhartha


First Published October 9, 2018 | Research Article

<https://doi.org/10.1177/0892705718805124>**Abstract**

This work investigates the mechanical, fracture toughness, and thermomechanical peculiarity of a novel functionally graded materials (FGMs)–based glass fiber–filled polyamide 66 (PA66) composites. FGMs-based PA66 are fabricated through a particularly designed mold and a punch. Punch is a rotating element of the mold and rotates at 1800 r/min for two min for the fabrication of FGMs. Gradation of fibers takes place in FGMs toward the periphery of the punch cavity due to the centrifugal force. Neat PA66 and homogeneous composites are also fabricated through the same mold for comparative study. Punch remains stationary during the fabrication of neat PA66 and homogeneous composites. PA66 granules filled with 15 wt% and 30 wt% of glass fibers are used to manufacture FGMs and homogeneous composites. Ignition loss test, hardness measurement, and scanning electron microscope (SEM) analysis are used to verify the gradation of glass fibers within FGMs. Result analysis concluded that FGMs performed better as compared to neat PA66 and homogeneous composites. FGMs-based thermoplastic composites have full scope to fabricate polymer gears used in low load applications. This manufacturing route shows a promising potential for fabrication of FGMs-based thermoplastics which otherwise is difficult to manufacture because of their high solidification rate at room temperature.

Keywords

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








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Volume 40, Issue 2, March 2019,

Original Article

Detection of Seizure Event and Its O Orthonormal *Triadic* Wavelet Based I

G. Chandel ^a  , P. Upadhyaya ^b , O. Farooq ^c , Y.U. Khan ^d Show more 
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<https://doi.org/10.1016/j.irbm.2018.12.002>

Highlights

- The use of *triadic* wavelet based features for se
- Long-term EEG signals were analysed.
- The method obtained 99.45% of accuracy and
- The efficiency compared with existing convent

Abstract


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

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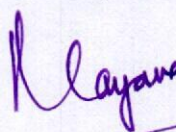
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Analog Integrated Circuits and Signal Processing, Volume 97, Issue 2 • November 2018 • pp 281–311

Published: 01 November 2018

0 0



Abstract

During the last three decades, a large number of new analog circuit building blocks have emerged beyond the well-known operational amplifier, operational transconductance amplifier, Current Conveyors and Current feedback operational amplifier. Among the new building blocks, the operational transresistance amplifier (OTRA) has received considerable attention in the literature. This paper presents a state-of-the-art review of the OTRAs, their bipolar and CMOS implementations and applications in linear and nonlinear analog signal processing/generation along with a comprehensive list of references covering the period from 1992 till date.

References

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Metamaterial-inspired miniaturized antenna loaded with IDC and meander line inductor using partial ground plane

Monika Singh ✉, Navneet Kumar, Santanu Dwari, Pradyot Kala

First published: 31 May 2019

<https://doi.org/10.1002/mmce.21863>

Citations: 4

Abstract

In this article, a novel omnidirectional compact dual band metamaterial-inspired antenna with CPW feed has been proposed for application of GSM 1800 (1.71-1.785 GHz/1.805-1.879 GHz), GSM 1900 (1.85-1.91 GHz/1.93-1.99 GHz), UMTS (1.92-2.17 GHz), WLAN/Wi Fi (4.9, 5, 5.9 GHz), HiperLAN1 (5.15-5.3 GHz), and HiperLAN2 (5.47-5.72 GHz) using a combination of meander line inductor and interdigital capacitor (IDC). The antenna consists of complimentary right/left handed (CRLH) transmission line on both sides of patch to excite zeroth order mode ($n = 0$). The rectangular slotted stubs act as a virtual ground for the structure using a short circuit condition at the end of the IDC. The zeroth order resonance (ZOR) frequency is mainly controlled by IDC and partially with the meander line inductor. The designed antenna operates from 1.72 to 2.22 GHz and 4.25 to 5.88 GHz with radiating size of $0.56\lambda_0 \times 0.35\lambda_0$ ($32 \times 20 \text{ mm}^2$), where λ_0 is the free-space wavelength at ZOR frequency of 5.27 GHz. The proposed antenna offers measured impedance bandwidth ($|S_{11}| < -10 \text{ dB}$) of 25.3 and 18.7% at 1.95 and 5.28 GHz and covers the targeted frequency bands. The proposed structure offers omnidirectional radiation patterns are congruous throughout the working band.

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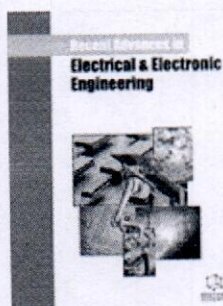
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Author(s): Neha Mehta*, Svav Prasad, Leena Arya

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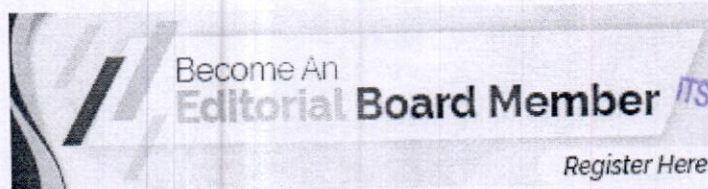
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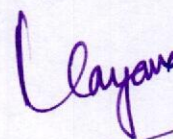


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Published Online: 27 September 2018

Accepted: September 2018

A curious observation of Pauli-Blocking in MoS₂-quantum dots/graphene hybrid system

Journal of Applied Physics 124, 124501 (2018); <https://doi.org/10.1063/1.5042278>Director
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Amulya Nemoori^{1,a)}, Himanshu Mishra^{2,a)}, Vijay Kumar Singh², P. K. Shukla³, Anchal Srivastava^{2,b)}, and Amritanshu Pandey^{1,b)}

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²Department of Physics, Institute of Science, Banaras Hindu University, Varanasi 221 005, India

³I.T.S. Engineering College, Knowledge Park-III, Greater Noida 201 308, India

a) Authors contributed equally.

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ABSTRACT

In this study, Pauli-Blocking has been observed in a 0D/2D MoS₂ quantum dots/graphene (MoS₂-QDs/graphene) hybrid system. For the observation of room temperature Pauli-Blocking in the 0D/2D system, a photodetector device based on n-type MoS₂-QDs and CVD grown graphene has been fabricated using a facile and lithography free technique. The current-voltage characteristics of the device have been performed at room temperature. The fabricated device shows a negative response under visible light ($\lambda \sim 400$ to 700 nm) illumination. The dark to photo current ratio of the device shows variation up to two orders of magnitude. This negative response, which results decrease in current under visible light illumination, may be attributed to the Pauli-Blocking due to high absorbance of photon energy in visible light range.


Furthermore, it is believed that the present study may provide an insight



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Original Paper | Published: 02 July 2018

Studies on multiferroic oxide-doped PVA-based nanocomposite gel polymer electrolyte system for electrochemical device application

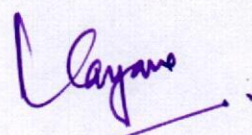
S. L. Agrawal, P. K. Shukla , Deepshikha Tripathi & C. P. Singh

Ionics **25**, 617–626 (2019)

236 Accesses | **4** Citations | [Metrics](#)

Abstract

The present work reports development of bismuth iron oxide (BFO)-doped PVA:(NH₄ CH₃COO) nanocomposite gel polymer electrolyte (NCGPE) films. XRD profiles revealed enhancement in the amorphous behavior of composite gel electrolyte upon incorporation of BFO as filler particles. I-t measurements exhibit ionic charge transport. The ionic conductivity of the electrolytes has been evaluated from impedance spectroscopy, and the


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PAPER: CLASSICAL STATISTICAL MECHANICS, EQUILIBRIUM AND NON-EQUILIBRIUM

Bhatia–Thornton fluctuations, transport and ordering in partially ordered Al–Cu alloys

R Lalneihpuii¹, Ruchi Shrivastava², C Lalnuntluanga^{4,1} and Raj Kumar Mishra^{3,1}

Published 21 May 2019 • © 2019 IOP Publishing Ltd and SISSA Medialab srl

Journal of Statistical Mechanics: Theory and Experiment, Volume 2019, May 2019

Citation R Lalneihpuii *et al* *J. Stat. Mech.* (2019) 053202

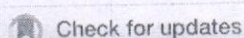
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¹ Department of Chemistry, Institute of Science, Banaras Hindu University, Varanasi-221005, India² Faculty of applied sciences & humanities, Department of Chemistry, ITS Engineering College, Greater Noida-201308, India³ Author to whom any correspondence should be addressed.⁴ Permanent address: Department of Chemistry, School of Physical Sciences, Mizoram University, Aizawl 796004, India


Received 10 December 2018

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Abstract

The Bhatia–Thornton (BT) correlation functions namely the number–number, concentration–concentration and number–concentration correlation functions in liquid binary melts are important parameters for understanding the complexities in binary liquids. In this paper, the microscopic BT correlation functions of liquid Al–Cu alloys are investigated using square well (SW) potential under

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Journal of Advanced Research in Dynamical and Control Systems

ISSN 1943-023X

Analysing Self - Similarity of Fractal Models Using K-Means Clustering Technique

Sandeep Kumar and Anil Kumar Solanki

Abstract:

Fractal dimension is a ratio of segments and the scaling factor that provides a statistical index of complexity, which shows how details of a pattern changes with different scales at which it is measured. It has also been characterized as a measure of the space-filling capacity of a fractal pattern that specifies how a fractal scales differently from the space it is embedded in. A fractal pattern dimension is not an integer. For the purpose of visualization, it helps whether a fractal has low or high dimension [3]. We shall use the concept of self-similarity of a data set, and the concept can be integrated with clustering techniques. We can use self-similarity of a data set for making faster and better inferences. In this paper, we propose clustering techniques of data mining to analyse the fractal patterns, and show how clustering can be the part of fractals.

Issue: 03-Special Issue

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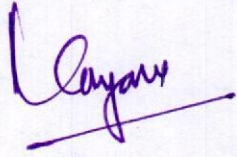
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Article

SPAS: An authentication scheme to prevent unauthorized access of information from smart card

January 2019 · *Pertanika Journal of Science and Technology* 27(1):175-192

Authors:



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Abstract

Nowadays internet has become indispensable part of one's life. Therefore, security and privacy are of critical concern to retain user's confidence in network services and applications. Several password verification based schemes/protocols have been used for authentication over insecure channel to protect resources from unauthorized access in networked environment. However, the schemes were not fault tolerant. Also, the feasibility for implementation in some of the applications was questionable. Therefore, we have devised a scheme SPAS (Secure and Provable Authentication Scheme) to overcome the issues prevalent in existing schemes. The objective was to keep the computational and communication cost low. The analysis of the presented scheme SPAS over existing schemes corroborates its effectiveness in tackling various attacks and uniqueness. Further, the performance analysis of the presented scheme is also given to strengthen the proposal.

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Novel optimization technique to charge E-rickshaw battery using single sensor based MPPT of SPV module

Issue title: Special Section: Intelligent tools and techniques for signals, machines and automation

Guest editors: Smriti Srivastava, Hasmat Malik and Rajneesh Sharma

Article type: Research Article

Authors: Ansari, Abdul Quaiyum (<https://content.iospress.com:443/search?q=author%3A%28%22Ansari, Abdul Quaiyum%22%29>)^a | Hasan, Mashhood (<https://content.iospress.com:443/search?q=author%3A%28%22Hasan, Mashhood%22%29>)^b | Islam, Noorul (<https://content.iospress.com:443/search?q=author%3A%28%22Islam, Noorul%22%29>)^c *

Affiliations: [a] Department of Electrical Engineering, J.M.I., New Delhi, India | [b] Department of Electrical Engineering, GCET Affiliated to AKTU, Lucknow, Greater Noida, Uttar Pradesh, India | [c] Department of Electrical Engineering, Research Scholar, J.M.I., New Delhi, India

Correspondence: [*] Corresponding author. Noorul Islam, Department of Electrical Engineering, Research Scholar, J.M.I., New Delhi, Pin: 110025, India. E-mail: noorul_i@hotmail.com (mailto:noorul_i@hotmail.com).

Abstract: The battery era has started to compensate the demand of the energy while the charging issues still exist. Thus, demand of reliable and optimized charging is required to charge cell/battery. In this paper novel optimized technique is proposed, based on gravitational search algorithm (GSA) to charge e-rickshaw battery using single sensor based maximum power point tracking (MPPT) of solar photovoltaic (SPV) module. There are various metaheuristic and heuristic techniques are available like Cauchy and Gaussian sine cosine optimization (CGSCO) intelligent technique, evolutionary algorithms, stochastic algorithms, Swarm optimization technique, ant colony technique, neural algorithms, fuzzy logic algorithms to optimize the charging current of cell/battery. These techniques take more iteration to give the optimal solution. Moreover, GSA is the high level intelligent technique which is used in multi area to optimize the various parameters in engineering fields. It is very ease to find the optimal solution in search space. This approach is novel in the field of e-rickshaw battery charging. Therefore, the mathematical algorithm based on GSA has been developed to optimize the current of charging cell/battery. The performance of GSA optimization technique is verified and compared with the metaheuristic based CGSCO optimization technique. It is observed that GSA is easy to design and reduce the cost of charger.

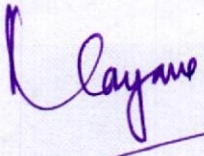
Keywords: Gravitational search algorithm, gravitational constant, boost converter, insolation, agent

DOI: 10.3233/JIFS-169792

Journal: *Journal of Intelligent & Fuzzy Systems* (<https://content.iospress.com:443/journals/journal-of-intelligent-and-fuzzy-systems>), vol. 35, no. 5, pp. 5077-5084, 2018

Published: 20 November 2018

Price: EUR 27.50


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ERRATA: OTRA-BASED MULTI-FUNCTION INVERSE FILTER CONFIGURATION

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DOI: 10.15598/aeee.v16i1.2572

Abstract. In the article published by mentioned authors with DOI: 10.15598/aeee.v15i5.2572 were found accidental errors in four references. These errors were caused by human factor and deficient communication between the authors and publisher. Correction is published on the basis of the author's request. The editorial members of *Advances in Electrical and Electronic Engineering* apologize to the authors and readers of the journal for not detecting the problem with references during the publication process.

1. Corrections

Namely, following wrong references: [5], [26], [27] and [42] were published in the article. References should be correctly read as follows.

References

- [5] GUPTA, S. S., D. R. BHASKAR, R. SENANI and A. K. SINGH. Inverse active filter employing CFOAs. *Electrical Engineering*. 2009, vol. 91, iss. 1, pp. 23–26. ISSN 1432-0487. DOI: 0.1007/s00202-009-0112-3.
- [26] CAM, U., F. KACAR, O. CICEKOGLU, H. KUNTMAN and A. KUNTMAN. Novel Two OTRA-Based Grounded Immittance Simulator Topologies. *Analog Integrated Circuits and Signal Processing*. 2004, vol. 39, iss. 2, pp. 169–175. ISSN 1573-1979. DOI: 10.1023/B:ALOG.0000024064.73784.58.
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Article

An ANDROID based gesture control robot

July 2017

DOI:10.1080/09720510.2017.1395178

Authors:



Monika Jain



Usha Tiwari



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Abstract

To reduce the programming burden of various robots, now a days Gesture based programming is a new form of representation. It will result in more innovative programming for complex real word problem based on non-verbal communication. Most of the past work had mainly focused on areas like navigation and manipulation; only some of the robotic systems are equipped with exile user interfaces that permit controlling the robot by natural means. To capture gestures through an android Smartphone this paper analyses the motion technology with an inbuilt accelerator and a Bluetooth module which controls the kinetics of a prototype robot. An application has been developed on the android OS to synchronize the Smartphone's gestures with the robot. The android OS platform is gaining popularity among software developers due to its powerful capabilities and open architecture. This paper also highlights the application of such a prototype robot in various fields like domestic, defence and disaster management.

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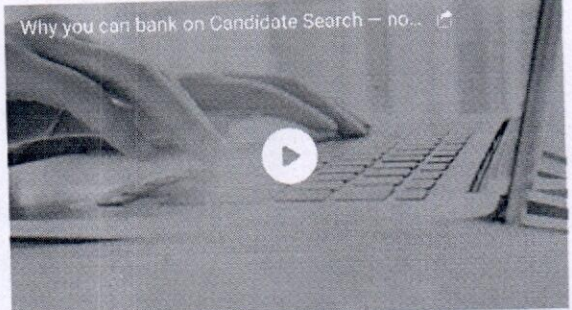
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Physicochemical Problems of Materials Protection |
Published: 15 March 2018

Corrosion Inhibition effect of *Clerodendron Colebrookianum Walp* Leaves (Phuinam) Extract on the Acid Corrosion of Mild Steel

Jay Prakash Rajan, Ruchi Shrivastava & Raj Kumar Mishra



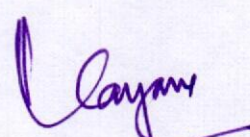
Protection of Metals and Physical Chemistry of Surfaces

53, 1161–1172 (2017)

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Abstract

The adsorption and anticorrosion effect of crude methanolic extract of *Clerodendron colebrookianum walp* leaves (CCWL) were investigated towards the corrosion of mild steel in 1 N HCl using gravimetric, potentiodynamic polarization, electrochemical impedance spectroscopy and Scanning Electron Microscope techniques. The results show that CCWL is a good


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OTRA-Based Multi-Function Inverse Filter Configuration

Abdhesh Kumar Singh, Ashish Gupta, Raj Senani
DOI: 10.15598/aeet.v15i5.2572

Abstract

A new OTRA-based multifunction inverse filter configuration is presented which is capable of realizing low pass, high pass and band pass filters using only two OTRAs and five to six passive elements. To the best knowledge of the authors, any inverse filter configuration using OTRAs has not been reported in the literature earlier. The effect of the major parasitics of the OTRAs and their effect on the performance filter have been investigated and measured through simulation results and Monte-Carlo analysis. The workability of the proposed circuits has been confirmed by SPICE simulations using CMOS-based-OTRA realizable in 0.18 μm CMOS technology. The proposed circuits are the only ones which provide simultaneously the following features: use of reasonable number of active elements (only 2), realizability of all the three basic filter functions, employment of all virtually grounded resistors and capacitors and tunability of all filter parameters (except gain factor, H_{-0} for inverse high pass).

The centre/cut-off frequency of the various filter circuits lying in the vicinity of 1 MHz have been found to be realizable, which has been verified through SPICE simulation results and have been found to be in good agreement with the theoretical results.

Keywords

Analogue signal processing; inverse active filters; Operational Transresistance Amplifier.

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Polymers for Advanced Technologies / Volume 28, Issue 12 / p. 1764-1777

Research article

Investigation of sub-micron size cenosphere fillers and filler loading on the mechanical and tribological peculiarity of polyester composites

Akant Kumar Singh ✉, Siddhartha, Sanjay Yadav

First published: 03 May 2017

<https://doi.org/10.1002/pat.4060>

Citations: 1

Abstract

This paper investigates the effect of sub-micron size cenosphere filler and filler loading on mechanical and dry sliding wear property of polyester composites. Composites are fabricated by filling with 10 and 20 wt% of 800 and 200-nm size of cenosphere filler particles. Neat polyester composite is also prepared for comparison analysis. Dry sliding wear test is conducted for these composites over a range of sliding distance with different sliding velocities and applied loads on a pin-on-disc wear test machine. Taguchi methodology and analysis of variance (ANOVA) is used to analyze the friction and wear characteristics of the composites. The artificial neural network (ANN) approach is implemented to the friction and wear data for corroboration. In this work, mechanical properties of composites such as hardness, tensile strength, tensile modulus, flexural strength, and compressive strength revealed that mechanical properties and wear resistance of the composites increase with a decrease in the particle size. The measured Young's moduli are comparable to standard theoretical prediction models. The morphology of worn composite specimens has been examined by scanning electron microscopy to understand the dominant wear mechanisms. Finally, optimal factor settings are determined using a genetic algorithm (GA). Copyright © 2017 John Wiley & Sons, Ltd.

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Citing Literature

Effect of sulphur concentration on the structural and electronic properties of ZnS nanoparticles synthesized using chemical precipitation method.

- **Source:** Journal of Materials Science: Materials in Electronics . Apr2017, Vol. 28 Issue 8, p6226-6232. 7p.
- **Author(s):** Sharma, Harit; Agrawal, S.; Shukla, P.
- **Abstract:** A systematic study is presented on the synthesis of ZnS nanoparticles by using simple chemical precipitation method without using any capping agent. The ZnS nanoparticles have been synthesized using precursor solution with different Zn:S ratio. The as synthesized nanoparticles have been characterized by X-ray diffraction (XRD), scanning electron microscopy (SEM), atomic force microscopy (AFM), UV-Vis absorption spectroscopy and impedance spectroscopy. The XRD patterns reveal the formation of ZnS nanoparticles with wurtzite hexagonal phase which changes to sphalerite phase for higher concentration of S in the precursor solution. XRD, SEM and AFM studies have shown enhancement in particle size on increasing sulphur content. SEM and AFM images depict formation of deformed spherical nanoparticles with particle size ranging from 10 to 50 nm. Optical absorption spectra of synthesized material show a red shift in the optical absorption on increase of S ion concentration. Variation in electrical conductivity obtained from impedance measurements at different temperatures has been suitably correlated to Davis-Mott model.
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Review

Carbon nanotube using spray pyrolysis

Annubhawi Annu ^a✉, B. Bhattacharya ^a✉, Pramod K. Singh ^a✉, P.

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<https://doi.org/10.1016/j.jallcom.2016.08.246>

Abstract

Spray pyrolysis is one of the most widely used method: mainly because of its scalability and - low cost of the carbon nanotube synthesis. Spray pyrolysis is a promising method to create carbon nanotubes by injecting metallocene-hydrocarbon solutions into a heated chamber. Carbon nanotubes can be formed simultaneously. The parameters such as the precursor concentration, injection rate and duration, surface, growth temperature, and the composition of gas, these parameters on the morphology of CNTs synthesis are presented in detail.



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Chemical Phys

Volume 493, 17 August 2017, P

Transport coefficients and validity of Stokes-Einstein relation in metallic melts: From excess entropy scaling laws

Ruchi Shrivastava^a, Raj Kumar Mishra^b

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<https://doi.org/10.1016/j.chemphys.2017.06.014>

Highlights

- Excess entropy in liquid metals was determined
- Transport properties were determined using e
- Stokes-Einstein relation is verified for square v
- Viscosity-entropy scaling law is formulated for

Abstract

Using the pair correlation function obtained via square χ (Chem. Phys. 457 13], we calculate the pair excess entropy S_{ex} and diffusion coefficients via Dzugutov's excess entropy-di

Ruchi Shrivastava

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Shading phenomenon analysis for a medium size 3.8 kW standalone PV system connected in series parallel configuration using MATLAB simulation

January 2017 · *International Journal of Applied Engineering Research* 12(15):4967-4975

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Abstract

Photovoltaic array exhibits highly nonlinear electrical characteristics and the maximum power point tracking (MPPT) is always challenging. It becomes more complex during partial shading condition. The P-V array characteristics for shading condition have multiple maxima points and conventional MPPT technique fails to track global maximum power point. The operating point may settle at local points. In this paper, a medium size 3.8 kW PV system is simulated and shading effect on PV array is analyzed for different shading pattern. This PV array consisting of 64 (8×8) PV modules connected in series and parallel configuration of 60 W each. The dc-dc boost converter is used to control and operate above system at Global maximum power point (GMPP). The P-V and I-V characteristics are plotted using Matlab/Simulink software platform and the simulation results are obtained to study shading effect.

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Fireworks Enriched P&O Algorithm for GMPPT and Detection of Partial Shading in PV Systems

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Aug 2016 *IEEE T POWER ELECTR*

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Polymer Composites / Volume 39, Issue 3 / p. 654-667

Article

Repercussion of manufacturing techniques on mechanical and wear peculiarity of zno particulate-filled polyester composites

Akant Kumar Singh✉, Siddhartha, Sanjay Yadav, Prashant Kumar Singh

First published: 11 March 2016

<https://doi.org/10.1002/pc.23982>

Citations: 6

Abstract

This article presents the comparison of mechanical and dry sliding wear peculiarity of zinc oxide (ZnO)-filled polyester composites, fabricated by two different techniques. These two techniques are simple mechanical stirring and vertical centrifugal casting. ZnO filled polyester based homogeneous composites are fabricated by simple mechanical stirring technique whereas composites fabricated by vertical centrifugal casting technique are functionally graded materials (FGMs). Dry sliding wear tests are performed over a range of sliding velocity (1.57–3.66 m/s), normal load (10–30 N), filler content (0–20 wt%), and sliding distance (1,000–3,000 m) using a pin-on-disc apparatus. This study establishes that the FGMs exhibit superior mechanical properties (except tensile strength) and wear resistance as compared with homogeneous composites. Among all the fabricated composites, FGMs filled with 20 wt% ZnO filler has maximum hardness and flexural strength, i.e., 70 HRL and 39 MPa, respectively. Compressive and impact strength is maximum for 10 wt% ZnO filled FGMs with 36 MPa and 1.3 J, respectively. The tensile strength of homogeneous composites is 21.7% higher as compared with FGMs for 10 wt% of ZnO filler loading. FGM filled with 20 wt% of ZnO filler has minimum specific wear rate of $0.33 \times 10^{-5} \text{ mm}^3/\text{Nm}$ and neat polyester has a maximum of $0.97 \times 10^{-5} \text{ mm}^3/\text{Nm}$. The morphology of worn surfaces is examined using scanning electron microscopy (SEM) and discussed. POLYM. COMPOS., 39:654–667, 2018. © 2016 Society of Plastics Engineers

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Article

Exploring the Possibility of Utilization of Red Mud Epoxy Based Functionally Graded Materials as Wear-Resistant Materials Using Taguchi Design of Experiment

August 2015 · *Advances in Polymer Technology* 36(1)

DOI:10.1002/adv.21567

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Abstract

The study aims for potential utilization of red mud (an industrial waste) to be utilized as a wear-resistant material. Investigations on mechanical and wear characteristics of red mud epoxy based homogeneous and their functionally graded materials (FGMs) developed with an intent of probable application in tribological systems are presented. The influence of significant operational parameters, material parameters, and their subsequent influences among themselves are explored. A specially designed experimental series is performed on a pin-on-disk machine with three different sliding velocities 105, 209, and 314 cm/s under three different loading conditions of 20, 30, and 40 N and compares the experimental results with the reported theoretical wear model. Artificial neural network approach is also applied to the wear data for subsequent validation. The comparative study indicates that although the homogeneous composites and FGMs exhibit relatively inferior mechanical properties, the sliding wear performance of the FGMs is better than homogeneous composites. It is also found that out of all synthesized composites FGMs exhibit the maximum impact strength and tensile modulus, which clearly indicates that the gradation achieved because the centrifugation technique enhances the crack arresting capability of the materials. The measured Young's moduli of homogeneous composites and FGMs were compared to standard theoretical prediction models. The measured moduli values showed good harmony with those predicted from Halpin-Tsai and Kerner models. Transmission electron microscopy microstructures confirm the continuous graded dispersion of red mud particles in the matrix.

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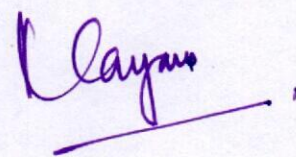
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Secure Mix-Zones for Privacy Protection of Road Network Location Based Services Users

Rubina S. Zuberi ^{1,2} and Syed N. Ahmad³[Show more](#)**Academic Editor:** Eduardo da Silva**Published:** 20 Apr 2016

Abstract

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January 2016

DOI:10.22232/stj.2016.04.01.08

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Title: A review of ultrawideband antennas with and without band notched characteristics

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Abstract: Mobile and wireless communication technologies are rapidly growing industrial markets since the last two decades. The future of these communication systems is to provide high data rate at anytime, anywhere in the world. In order to transmit and receive more and fast information, large bandwidth is required. To achieve this, we require antennas with property of wide bandwidth or multi bandwidth. Therefore, bandwidth enhancement is currently a popular topic of research. This is achieved by the introduction of UWB range by FCC for the specific bandwidth of 7.5 GHz (i.e., from 3.1-10.6 GHz). It is planar, cheap, and compact in size and have low profile with the VSWR ≤ 2 across the whole band of operation. The focus of this paper is to study and analyse the types of UWB antennas, which are available and previously designed. Along with that different method of notching frequency bandwidths, for filtering purpose are studied.

Keywords: survey; review; ultra wideband antennas; UWB antennas; band-notched antennas; multi-band antennas.

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