



K S R Institute for Engineering and Technology

Tiruchengode, Namakkal (Dt), Tamil Nadu

(Approved by AICTE New Delhi & Affiliated to Anna University Chennai)

BE (CSE, EEE, ECE, Mech) & B.Tech (IT) Programmes are Accredited by NBA

3.3.2 Number of Research Papers per Teachers in the Journals during last five years

INDEX

Academic Year	Number of Publications
2019 - 2020	61
2018 - 2019	62
2017 - 2018	55
2016 - 2017	88
2015 - 2016	66



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3.3.2 Number of Research Papers per Teachers in the Journals during the Academic Year 2019 – 2020

Title of Paper	Name of the Author/s	Department of the Teacher	Name of Journal	ISSN Number
An Artificial Bee Colony Algorithm to Mine Periodic High Utility Itemsets	Dr.B.Kalaavathi	CSE	International Journal of Innovative Technology and Exploring Engineering	2278-3075
Trust and Privacy Based Vertical Handoff Decision Algorithm For Telecardiology Application In Heterogeneous Wireless Networks	Dr.B. Kalaavathi	CSE	Journal of Ambient Intelligence and Humanized Computing	1868-5145 1868-5137
A Secured and Authorized Seen Protocol for Mobile Multimedia Data Collection Scheme In WMSNS	Dr. M.Vimaladevi	CSE	Journal of Xi'an University of Architecture & Technology	1006-7930
Hybrid Naive Bayes-Adasvm Based Malware Prediction In Mobile Applications	Dr.M.Vimaladevi	CSE	Journal of Critical Reviews	2394-5125

Smart F2C Profiling Based On Cultivated Product Direct Marketing System	Dr. P.Vijayalakshmi	CSE	International Journal of Scientific Research and Engineering Development	2581 - 7175
A Secured and Authorized Seen Protocol for Mobile Multimedia Data Collection Scheme In WMSNS	Mr.V. Prakasham	CSE	Journal of XI'AN University of Architecture & Technology	1006-7930
Secured Robustness Optimization Scheme with Multi-Population Co-Evolution for Distributed Wireless Sensor Networks	Mr.V. Prakasham	CSE	International Journal of Engineering Science and Computing	2321 3361
Issues In Various Recommender System In E-Commerce – A Survey	Mr. R.Venkatesan	CSE	Journal of Critical Reviews	2394-5125
Secured Robustness Optimization Scheme With Multi-Population Co-Evolution for Distributed Wireless Sensor Networks	Mr.V.Gopinath	CSE	International Journal of Engineering Science and Computing	2321 3361
Secured Robustness Optimization Scheme with Multi-Population Co-Evolution for Distributed Wireless Sensor Networks	Ms. R.Sathyapriya	CSE	International Journal of Engineering Science and Computing	2321 3361
A Secured and Authorized Seen Protocol for Mobile Multimedia Data Collection Scheme In WMSNS	Ms.V.Sowmitha	CSE	Journal of XI'AN University of Architecture & Technology	1006-7930
Secured Robustness Optimization Scheme With Multi-Population Co-Evolution for Distributed Wireless Sensor Networks	Ms.V.Sowmitha	CSE	International Journal of Engineering Science and Computing	2321 3361

Cloud Computing Components, Services, Tools & Its Roadmap to Organization	Mr.T.Rajan	CSE	International Journal of Computer Science & Engineering Research	2319-7323
Sustainable Development of Universal Electronic Control Unit for Fuel Saving In Automobiles to Protect the Environment Pollution	Dr.R.Jeya Bharath	EEE	Journal of Electrical Engineering	1582-4594
Sustainable Development of Universal Electronic Control Unit for Fuel Saving In Automobiles to Protect the Environment Pollution	Dr.P. Veena	EEE	Journal of Electrical Engineering	1582-4594
Power System Stability Enhancement In Two Machine System By Using Fuel Cell As STATCOM (Static Synchronous Compensator)	Dr.S.Velmurugan	EEE	Materials today Proceedings	2214-7853
Development of Smart Robot Car for Surveillance	Dr. S. Velmurugan	EEE	International Journal of Advanced Science and Technology	2005-4238 2207-6360
Visualization of Virtual Environment Through LAB VIEW Platform	Dr. S. Velmurugan	EEE	Materials Today: Proceedings	2214-7853
An Efficient Authentication Scheme For Iot Based WBANS	Dr. S. Velmurugan	EEE	European Journal of Molecular & Clinical Medicine	2515-8260
Power System Stability Enhancement In Two Machine System By Using Fuel Cell As STATCOM (Static Synchronous Compensator)	Mr. C Santhakumar	EEE	Materials today Proceedings	2214-7853

An Efficient Authentication Scheme For Iot Based WBANS	Mr. C Santhakumar	EEE	European Journal of Molecular & Clinical Medicine	2515-8260
A High Step-Up Quadratic Boost Converter Integrated With Voltage Multiplier	Dr. Jeya Bharath	EEE	Journal of Electrical Engineering	1582-4594
A High Step-Up Quadratic Boost Converter Integrated with Voltage Multiplier	Dr. Veena	EEE	Journal of Electrical Engineering	1582-4594
Speed Bump Detection Using Otsu'S Algorithm And Morphological Operation	Dr. T. Srihari	EEE	International Journal on Emerging Technologies	: 0975-8364 2249-3255
Real-Time Detection of Unmarked Speed Bump for Indian Roads	Dr. T. Srihari	EEE	European Journal of Molecular & Clinical Medicine	2515-8260
Effective Crop Loss Assessment For Picture Based Insurance Claim	Dr. T. Srihari	EEE	TEST Engineering & Management (Scopus Indexed)	0193-4120
An Implementation of GFDM Transmitter For 5G Waveform Generation	Dr.R. Nandakumar	ECE	Journal of Xi'an University of Architecture & technology	1006-7930
Speed Bump Detection Using Otsu'S Algorithm And Morphological Operation	Dr.R. Nandakumar	ECE	International Journal on Emerging Technologies	0975-8364, 2249-3255

A Review On Block Chain Technology Applications With An Emphasis On Health Care	Dr.R. Nandakumar	ECE	International Journal of Advanced Science and Technology	2207-6360
Health Management Of Crop Precision With Smart Farming Technologies Using Iot'	Dr.R. Nandakumar	ECE	Solid State Technology	0038-111X
Detection of Abnormalities In Kidneys Using Image Processing	Dr.R. Nandakumar	ECE	International Journal of Emerging Trends in Engineering Research	2347 - 3983
Deep Learning Based Modulation Classification for 5G And Beyond Wireless Systems	Dr.R. Nandakumar	ECE	Peer-to-Peer Networking and Applications	1936-6450, 1936-6442
Data-Driven Methods for Next Generation of Wireless Communication Network	Dr.R. Nandakumar	ECE	International Journal of Advanced Trends in Computer Science and Engineering	2278-3091
Effective Crop Loss Assessment For Picture Based Insurance Claim	Dr.W. Deva Priya	ECE	TEST Engineering & Management	0193-4120
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Health Management of Crop Precision With Smart Farming Technologies Using IOT	Mr. P. Premkumar	ECE	Solid State Technology	0038-111X
Low Power High Speed Estimated Reconfigurable Multiplier for Multimedia Signal Processing	Mr.M.Udhayakumar	ECE	International Journal for Scientific Research and Development	2321-0613
Low Power High Speed Estimated Reconfigurable Multiplier for Multimedia Signal Processing	Mr. B.Vinothkumar	ECE	International Journal for Scientific Research and Development	2321-0613
Low Power High Speed Estimated Reconfigurable Multiplier for Multimedia Signal Processing	Mr.R.Pradeep	ECE	International Journal for Scientific Research and Development	2321-0613
Low Power High Speed Estimated Reconfigurable Multiplier for Multimedia Signal Processing	Ms.S.Dhanalakshmi	ECE	International Journal for Scientific Research and Development	2321-0613
Numerical Analysis of Fluid Flow and Heat Transfer In Single Tube Fin Arrangement Of An Automotive Radiator	Dr. P.Murugesan	Mechanical	International journal of thermal technologies	2277-2019
Heat Transfer and Friction Factor Characteristics of A Double Pipe Heat Exchanger Fitted with Variant Plain Tape Insert	Dr. P.Murugesan	Mechanical	Thermal Science	2334-7163
Investigation of Mechanical Properties of Jute Fibrer Epoxy Reinforced Composites Using Taquchi Method	Dr.P.Gopinath	Mechanical	International Journal of Tierarztliche Praxis	0303-6287

Design And Analysis of Hybrid Copper Matrix Composites Synthesized By Powder Metallurgy	Mr.S. Rajkumar	Mechanical	International Research Journal of Modernization in Engineering Technology and Science	2582-5208
Design And Performance Analysis Of P2H Electric Vehicle (Porsche Hybrid Electric Two-Wheeler)	Mr. P. Manikandan	Mechanical	International Research Journal of Modernization in Engineering Technology and Science	2582-5209
Investigation of Mechanical Properties of Jute Fiber Epoxy Reinforced Composites Using Taquchi Method	Mr. A.Mohanraj	Mechanical	International Journal of Tierarztliche Praxis	0303-6286
An Attempt To Enhance The Time of Reply For Web Service Composition With QOS	Dr. P.Meenakshi Devi	Information Technology	International Journal of Enterprise Network Management	1748-1252
Gene Populated Spectral Clustering For Energy Efficient Multiple Intrusion Detection and Responsive Mechanism For MANET	Dr. P.Meenakshi Devi	Information Technology	Journal of Electrical Engineering	1582-4594
Performance Analysis on Cluster-Based Intrusion Detection Techniques for Energy Efficient and Secured Data Communication in MANET	Dr. P.Meenakshi Devi	Information Technology	International Journal of Information Systems and Change Management	1479-3121 1479-313X
Design of A Hybrid Logic Based Adaboost Decision Tree Model for Identifying Web Attacks	Dr.K.Gowsic	Information Technology	International Journal of Advanced Trends in Computer Science and Engineering	2278-3091
Survey on Healthcare Hazard Control Responsibilities, Practice and Analysis	Ms. K.G.Lavanya	Information Technology	International Research Journal of Multidisciplinary Technovations	2582-1040
Survey on Healthcare Hazard Control Responsibilities, Practice and Analysis	Ms. L.Priyanga Devi	Information Technology	International Research Journal of Multidisciplinary Technovations	2582-1040

Survey on Healthcare Hazard Control Responsibilities, Practice and Analysis	Mr. D Balakrishnan	Information Technology	International Research Journal of Multidisciplinary Technovations	2582-1040
Enhancing QOS In MAC Layer for IOT Enabled Multihop Mobile Networks	Ms.S.S.Ramyadharshni	Information Technology	International Journal of Advance Research, Ideas and Innovations in Technology	2454-132X
A Comparison of Word2Vec Models for Identifying Similar Words Using Deep Learning Approaches	Ms.S.Uma	Information Technology	International Journal of Advanced Science and Technology	2005-4238
Effect of Calcination Process On Structural and Optical Properties of Tungsten Doped Zno Nanostructures	Dr. V. Devabharathi	Physics	International Journal of Multidisciplinary	2455-3085
Ultra Sensitive Molybdenum Disulfide (MoS ₂)/ Graphemebased Hybrid Sensor for the Detection of NO ₂ and Formaldehyde Gases By Fiber Optic Clad Modified Method	Dr.D.Madhan	Physics	Optics and Laser Technology.	0030-3992
Acid Red 88 Dye Degradation By Green Synthesized CeO ₂ /RGO Nanohybrid Photocatalyst Under Solar Light	Dr.B. Murugesan	Chemistry	Indian Journal Of Environmental Protection	0253 – 7141
Green Synthesis and Applications of Nano CeO ₂ /RGO Solar Active Photocatalyst for the Degradation of Basic Auramine-O Dye	Dr.B. Murugesan	Chemistry	Asian Journal of Chemistry	0975-427X 0970-7077
Corrosion Behaviour of 18 Carat Gold In Ringer Solutions In The Presence of Sodium Chloride and Glucose	Ms.S.Agiladevi	Chemistry	European Chemical Bulletin.,	2063-5346

An Artificial Bee Colony Algorithm to Mine Periodic High Utility Itemsets

S. Viveka, ~~B. Kalaavathi~~

Abstract: High utility itemset mining is one of the key research areas in data mining in recent years. The main challenge in high utility itemset mining is the exponential growth space for finding the high utility itemsets. Several algorithms were proposed to mine high utility itemsets and all of them suffer because of the huge search space. Genetic Algorithms (GA) are now attracting researchers since it reduces the search space tremendously. In this paper, a novel algorithm based on Artificial Bee Colony PHUIM-ABC is proposed to mine the periodic high utility itemsets. During initial phase, the transaction database is scanned to find the 1-High Transaction Weighted Utility Itemsets (1-HTWUI). The 1-HTWUI is used as measured as the parameter in assigning the onlooker bee. Five real life data sets are used to evaluate the performance of the proposed algorithm with the existing state-of-art algorithms. The execution time and memory usage are the parameters used to measure the performance. Experimental results show that the proposed PHUIM-ABC algorithm performs better than the state-of-art non heuristic algorithms.

Index Terms: Artificial bee colony, Genetic algorithm, High utility itemset, Itemset mining, Periodic high utility itemset, Utility mining,

I. INTRODUCTION

Knowledge discovery in database (KDD) is one of the major research areas. It is because the data contains many hidden and highly useful information. Many organizations have huge data, and these data can be analyzed to extract the useful information which is hidden inside. These data exponentially increases day by day. Association Rule Mining (ARM), Clustering, Classification, Linear Regression are various data mining technique to extract the information from hidden data. The Frequent Pattern Mining (FPM) is a part of data mining which finds the frequently occurring patterns in the databases. ARM finds the associations that exist between the frequent patterns. Both the frequent pattern and ARM finds the information based on the threshold value given as the user input.

Out of the many data mining algorithms ARM attracted many researchers, and number of algorithms has been developed in ARM. ARM considers only the number of times the item appears in the transaction but does not consider the importance of it. In marketing, web stream databases the profit of the items also plays an important role. An item may not appear frequently in a database but the infrequent item may earn more profit. These infrequent high profit item needs to be considered in finding the itemset. High Utility Itemset

Mining (HUIM) is a successor of ARM which finds the high profitable items. Instead of finding the frequent pattern above the user specified threshold HUIM finds the High Utility Itemsets (HUIs). High Utility Itemset (HUI) is the item whose profit in the database is greater than or equal to the user specified threshold profit. The utility measurement can be in terms of utilization, cost, profit, and others. The major challenge faced in this is that the downward closure property is not satisfied. The downward closure property is satisfied in FPM and ARM. During the first step, the 1-candidate itemset is found, and the $i+1$ -candidate patterns are found from the i -candidate patterns. The search space of $i+1$ -candidate itemset is limited to i -candidate itemset but this property is not satisfied in the HUIM. The search space of finding HUIM grows exponentially with the length of the patterns. Many algorithms have been introduced to find the HUIM efficiently. The two phase miner is a state of art algorithm which mines the HUIM effectively in two phases. Downward closure property using transaction weight has been used in this two phase miner to effectively prune the search space. An enhanced version of the algorithm FHM uses a structure EUCS based on co-occurrence pruning to trim down the search space. UP tree and UPTree + which are tree based algorithms have been proposed by reducing the search space by upper bounds.

Another tree based algorithm is proposed by Lin et al. which used condensed high-utility pattern (HUP)-tree. FP tree and TWU based algorithm for mining HUI is proposed by Han et al. (2000)[1]. Lan et al. (2014)[2] proposed an indexed projection of the dataset for mining HUI, this algorithm used a different approach of projecting pseudo database for every iteration instead of depth first approach used in tree based algorithms. These algorithms do not consider the period of occurrence of an itemset and these HUI mining algorithms cannot be directly useful for PHUI mining. To address these issues periodic high utility mining is proposed. In this proposed work a new algorithm PHUIM-ABC is proposed to mine all the high profit items that occurred in the transaction during the specified period.

II. LITERATURE SURVEY

Liu et al. (2005)[3] proposed Mining using Expected Utility MEU algorithm for HUIM. The downward closure property is not satisfied in HUIM. A novel approach to include downward closure property in HUIM is proposed by using over estimation method.

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Trust and privacy based vertical handoff decision algorithm for telecardiology application in heterogeneous wireless networks

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Abstract

Telecardiology is one of the emerging fields of telemedicine to improve the cardiac patient's life quality. It uses the information and communication technologies to monitor the cardiac patients by healthcare professionals at distant. The telecardiology system demands for ubiquitous connection to assure promising services. Such a seamless service is provided by heterogeneous wireless technology. But the open network infrastructure of the heterogeneous networks is prone to various security attacks which makes patient privacy susceptible. Therefore, in this paper, the telecardiology system incorporated with Trust and Privacy based Multi-attribute Vertical Handoff decision algorithm towards decide on an best possible association amongst the available alternative candidates based on the patient health condition. Simulation results show enhancement in provisions of handoff rate, reduced blocking probability and improved performance throughput.

Keywords Telecardiology · Ubiquitous · Prone · Telemedicine · Echocardiology

1 Introduction

The speedy increase in information and communication technologies drives to the progression of telemedicine (Busanelli et al. 2011). Telemedicine relies on the safe transmission of medical data and information for the purpose of improving a patient's health. It makes use of advanced wireless communication technologies to overcome the barriers in health services to the patients located distantly. The deployment of telemedicine rationalizes the patient's care delivery, minimizes the cost and time by avoiding needless diagnostics and travelling, minimizes the unnecessary hospitalization, and promotes post hospital care. It supports emergency healthcare,

patient tele-monitoring, tele-cardiology, tele-pathology, tele-surgery, tele-radiology, tele-oncology and tele-psychiatry to serve the patients who are not in the hospital's vicinity (Persis Urbana Ivy et al. 2012).

At present, cardiovascular disease is considered as one of the leading causes of death. So, it is essential to prevent and deal with this chronic disease. Telecardiology is one of the emerging fields of telemedicine to advance the cardiac patient's life excellence and decrease transience by improving subsequent patient follow up rate, reduced repeated and long-term hospitalizations and minimal expenses related to health.

The application areas of the telecardiology system (Pasquale Caldaro et al. 2017) are,

- Pre-hospital finding of acute myocardial infarction by means of transmitting ECG signal.
- Control of devices like pacemakers, defibrillators at distant.
- Chronic heart failure patient observation.
- Patients arrhythmias monitoring.
- Echo images transmission for a second opinion to the specialized centers.

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A Secured and Authorized SEEN Protocol for Mobile Multimedia Data Collection Scheme in WMSNs

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Abstract—Wireless Multimedia Sensor Networks (WMSNs) produce enormous amounts of big multimedia data. Due to big data, Multimedia Sensor Nodes (MSNs) cannot store generated multimedia data for a long time. In this situation, mobile sinks can be used for information assortment. However, because of defenseless nature of wireless networks, there is a requirement for a productive security plan to validate both MSNs and mobile sinks. In this paper, we propose a scheme to protect an underlying WMSN during mobile multimedia big data collection. The proposed scheme is a two-layer scheme. At the primary layer, all MSNs are circulated into little clusters, where each cluster is spoken to by a solitary cluster Head (CH). At the second layer, all CHs verify identities of mobile sinks before sharing multimedia data and uses Secured and Authorized Selective Encryption (SEEN) protocol for assuring high data trustworthiness requires that the system satisfies two key security properties: confidentiality and integrity. We propose a Secured and Authorized SEEN method to secure big sensing data streams that satisfies the desired multiple levels of confidentiality and data integrity. We assess the exhibition of the proposed scheme through broad simulation results. The reenactment results demonstrate that the proposed scheme performs better when contrasted with existing state-of-the-art approaches as far as versatility and handshake span. The proposed scheme is likewise dissected as far as validation rate, data newness, and packet conveyance ratio, and has indicated a superior performance.

Index Terms—Big data stream, selective encryption, data confidentiality, data integrity, WMSNs, multimedia, clusters

I. INTRODUCTION

TRADITIONAL concept of the Internet of Things (IoT) consists of small battery-operated sensing devices that are unable to perform long-range wireless communication [1]. These sensing devices usually form a small Wireless Sensor Network (WSN), and forward sensed data to a nearby Base Station (BS). In WSNs, computationally-complex tasks are always performed at BS. In recent years, evolutionary steps have been taken in the field of WSNs where audio and visual sensors are integrated into simple sensor nodes and transformed them into Multimedia Sensor Nodes (MSNs). These nodes are able to store, correlate and fuse both multimedia and non-multimedia data [2].

The MSNs are gaining the attention of researchers across the globe due to their wide range of applications in daily lives, such as e-health, transport management system, and surveillance systems. For example, in smart cities, smart cameras installed at major junctions, roads and highways can capture current situation of vehicular traffic, and forward captured multi-media data to either local or remote cloud servers for further processing and analysis.

Data produced from a large variety of sources using sensing devices are streamed towards Data Stream Managers (DSM) for processing and decision making. This trend gives birth to an area, called big data stream [19], [20]. The verity of applications and data source makes the need for data dependability such

HYBRID NAIVE BAYES-ADASVM BASED MALWARE PREDICTION IN MOBILE APPLICATIONS

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ABSTRACT: Employing Mobile applications for secured and sensitive real time applications like banking, e-commerce, etc. is increasing day by day and it has created as an unbreakable bondage in our life survival. Simultaneously, there is a rise in danger and fraudulency targeting us primarily by invoking malware mobile apps. The identification and elimination of such malwares turned out into a serious challenge, since there is only inadequate availability of resources and restricted number of privileges granted to the users. Traditional methods based on structured features such as permissions and sensitive Application Programming Interface (API) lacks high-level behavioral semantics to detect evolving malware. As a remedy for this issue, a Machine Learning approach collided with Support Vector Machine (SVM) is being proposed in this paper for leveraging higher computing power of a server or cluster of servers. In this paper, we proposed a novel Android malware detection method based on method-level correlation relationship of application's abstracted API calls named Hybrid Naive Bayes-Adasvm Based Malware Prediction algorithm. We combine machine learning to identify the different behavioral patterns of malicious and benign apps to build the detection system. The results of our empirical evaluation would prove our system is competitive in terms of classification accuracy and detection efficiency. Experimentation has been carried out on Drebin (benign 5.9K and malware 5.6K) and AMD (benign 20.5K and malware 20.8K) datasets. It has been proved that proposed algorithm would achieve 96% and 98% detection results both in Accuracy and F-measure.

KEYWORDS: Malware Detection, SVM, Naïve-Bayes

I. INTRODUCTION

Google Play store has become as a prominent digital sharing service in our day to day life. Simultaneously it has become a source for multiple issues related to security, where numerous unauthorized and malicious software has been allegedly uploaded by the play store and also downloaded by the users. The popularity of the success of Android app markets lead to deceitful and malicious behaviors. The hackers utilize these app markets as a launch pad for their malware applications. To increase the ranking and prominence of the apps, the fraudulent developers surges their popularity into economic benefits and speed up the proliferation.

The app stores updates its leader board on daily basis and displays ranking information and also analyze the most admired application that lead the growth of mobile apps. A historical record is maintained for recognizing the leading session of an app. Based on the number of downloads by the users and the progressive growth of the ranking, the income is highly predicted. The fraudulent developers incorporate various alleged ways to promote the apps and inducing the higher number of downloads within a shorter period of time interval. They follow black hat basis and implement "internet bots" or "human water armies" for hiking the ratings. Normally, ratings are being done on two restrictions: (i) the app could be rated only once from a user login, and (ii) limiting the number of users from an IP address per day. The occurrence of fraudulent ranking mostly arises from the leading sessions. Various techniques of evidences such as ranking based, rating based, review based have been adopted to rate the app. Among these, review based evidence allow the users to post textual feedback and comments for reviewing the apps. Due to the existence of massive number of apps, it seems to be very tedious for identifying the fraudulency comments. The efforts for identifying and eliminating malware are not always successful.

The previous works of mobile malware detection and analysis explored both static and dynamic analysis of app executables. But they are predicted to bypass antivirus tools. To explore all the above said issues, this paper has been emerged to highlight on the following: discovering the traces left by fraudsters, correlate review activities,

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SMART F2C PROFILING BASED ON CULTIVATED PRODUCT DIRECT MARKETING SYSTEM

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Abstract:

Problem statement in
Description System that provides
farmers an interface to sell their
produce , and connect with the
buyers all over India Simple
interface that works on mobile, SMS
to upload produce details and
respond via phone and SMS (taking
care of digital divide). Interface for
anyone to buy the produce/vegetable
– initially visit the place and buy or
have courier service integrated to
deliver the vegetables Farmers can
get a better price for their produce,
no additional cost spent in marketing
and delivery of goods, however they
can choose to charge more by
delivering the items themselves.

Farmers, Restaurant owners, Buyers
, Courier Companies, Delivery
Agencies, Vegetable Vendors. Better
rates for the vegetables, Make the
Farmers live with pride and make
additional income. Practical and
reasons why this idea could be a
challenge Brokers ,Govt rules
Overall profitability in the deal for
the buyer to purchase directly from
farm , excluding transportation.
Technology that can be used as a
platform for connecting car buyer to
Seller Domain Bucket.

o Agriculture

o E-Commerce

o Payment

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A Secured and Authorized SEEN Protocol for Mobile Multimedia Data Collection Scheme in WMSNs

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The MSNs are gaining the attention of researchers across the globe due to their wide range of applications in daily lives, such as e-health, transport management system, and surveillance systems. For example, in smart cities, smart cameras installed at major junctions, roads and highways can capture current situation of vehicular traffic, and forward captured multi-media data to either local or remote cloud servers for further processing and analysis.

Data produced from a large variety of sources using sensing devices are streamed towards Data Stream Managers (DSM) for processing and decision making. This trend gives birth to an area, called big data stream [19], [20]. The verity of applications and data source makes the need for data dependability such



Secured Robustness Optimization Scheme with Multi-Population Co-Evolution for Distributed Wireless Sensor Networks

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Abstract:

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the most proficient method to improve scale-free topologies o withstand malicious attacks. Some proposed approaches attempt to improve the robustness of systems with Genetic Algorithm (GA) [5]. Due to single population of candidate solutions, it brings a typical limitation called premature convergence [6], in which the evolution falls into a local optimum too early, resulting in a solution far from the global optimum. Besides, it is known that multi-population genetic algorithm can effectively overcome this limitation by using multiple populations to evolve together. Different probability of crossover operator and mutation operator are assigned to each population of multiple-population. Individuals with high fitness values can be introduced into other different populations through migration operator, which can effectively prevent falling into a local optimum. Therefore, in this paper, we propose to use multi-population co-evolution to enhance the robustness of scale-free topologies. To approve this idea, we give a solid plan called Robustness Optimization with multi-population Co-development for scale-free. This paper proposes a novel method that efficiently finds (nearly) all unrestorable cutsets. The proposed method avoids the computation issues by employing a compressed data structure named the zero-suppressed binary decision diagram, or zero-suppressed binary decision diagram (ZDD) [6], which allows us to represent a huge non convex space in a compressed manner, and also to execute efficient algebra on the compressed space. ZDDs have been successfully applied to the loss minimization problem of distribution networks [7]; a non convex space of 1070 configurations were efficiently handled to find an optimal configuration.



ISSUES IN VARIOUS RECOMMENDER SYSTEM IN E-COMMERCE – A SURVEY

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Abstract

The replacement of traditional shopping fashion by the various modes of online shopping in real-time. Because of traditional shopping, most of them are getting into real feel about the product whichever they buy. The product features will be manually realized by the consumers whereas in online shopping all the consumers believe the descriptive summary of the products and the various factors based on the sold historical data. Now a day's modern shopping method is moving gradually towards hitting more number of customers. Here recommendation system playing a vital role in suggesting the product by considering the earlier records and increasing the demand. Many of the consumers are attracted by factors like deals on an item, rating, review, and cost of the product. Through these factors, most of the consumers are attracted to taking online shopping instead of traditional shopping methods. For suggesting the products to consumers, many kinds of recommendation algorithms are applied using machine learning and deep learning technology to train the system automatically by observing the customer behavior patterns. But the believing factors of the product will be forged some time; in such cases, consumers are not satisfied with their expectations. The overall survey of this paper will address the research gap and opportunities with the recommendation system.

Keywords Recommendation System, Bigdata, Collaborative Filtering, Machine Learning, Deep Learning, CRM, Emotional Intelligence, Influence Maintenance, Blockchain, Deep Recommender System.

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INTRODUCTION

Due to the advancement in online shopping, the recommender system concept has been widely applied by many of the e-commerce sites. The ultimate role of this technology is to analyze the item sales history, user purchase record and many of the implicit factors like liking, adding to wish list, adding to cart, bookmarking, looking for deals that are utilized to give a recommendation of an item to the customer. Basiliyos Tilahun Betru et.al[1] address the various issues with the traditional recommendation systems like content-based recommendation systems, collaborative filtering, Hybrid recommendation. All these were analyzed with the deep learning technology to assess the accuracy of the recommendation system. The content-based recommendation techniques to attempt to suggest the objects that are comparable to those a particular user has adored earlier. Collaborative filtering is a technique of creating automated projections regarding the pursuits of an individual user by gathering choices or taste data from several users. The challenge of collaborative filtering is to forecast how well a user is going to like a particular item that he has not evaluated a series of ancient preference judgments for a community of clients. CF could be carried out in two ways, like item-based CF and user based CF by using two kinds of algorithms such as model-based and memory-based algorithms.

LITERATURE REVIEW

Ahmed Doha, Nada Elnahla et.al[2] showed that the behavioral intention towards social commerce sites and behaviors that are most commonly done by the consumers. Based on the consumer behavioral pattern consumers can be drawn to social commerce primarily for the pursuit of social values. The addressed research model of the works has been utilizing the three perspectives such as utilitarian, economic and social perspective. The obtained result of their work is advancing a social view, which is hedonic in nature and results confirm all three perspectives. E.W.T. Ngai et al

[4] conducted a survey on various applications of data mining methods specific to Customer Relationship Management i.e., CRM. It includes a series of procedures and facilitating systems endorsing a company's plan to develop profitable and long-term relationships with certain customers. They addressed the research field of client retention and have received the most scientific study in the spotlight. With the more findings of limitations across their survey, they concluded that policy creators have to both maintain important customers and improve the lifelong value of the client. By itself, customer development and retention are both essential to providing a pleasant and long-term relationship with their clients.

Timur Osadchiy, Ivan Poliakov et.al[3] started their research work with a recommendation procedure based upon techniques like content-based and collaborative filtering. The application is taken to demonstrate their work on the food recommender system. They implemented recommender algorithms based upon an inherent social graph, association rule and analyzing pairwise association. Their evaluation among these three methods the pairwise association rules play superior on the specified dietary recall system. pairwise association rules (PAR) suggest foods that are expected to be noticed with either of IF in pairs. Throughout the training phase PAR for each noted food calculates the number $OD [f]$ of foods that include that food. Oscar Araque et.al.[5] applied deep learning techniques to do sentiment analysis in social applications. They applied their techniques to the movie review platform. It has been taken by six phases of work by them. Initially, they were tried with the linear machine learning algorithm to create a deep learning-based sentiment classifier utilizing a word embeddings paradigm. The developed classifier functions as a baseline to be compared to the following results. Next to that, they worked on two ensemble methods which combined their baseline classifier with other side classifiers utilized extensively in Sentiment Analysis. By the third model, they worked out on two prototypes for which combines both the



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A Secured and Authorized SEEN Protocol for Mobile Multimedia Data Collection Scheme in WMSNs

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Abstract—Wireless Multimedia Sensor Networks (WMSNs) produce enormous amounts of big multimedia data. Due to big data, Multimedia Sensor Nodes (MSNs) cannot store generated multimedia data for a long time. In this situation, mobile sinks can be used for information assortment. However, because of defenseless nature of wireless networks, there is a requirement for a productive security plan to validate both MSNs and mobile sinks. In this paper, we propose a scheme to protect an underlying WMSN during mobile multimedia big data collection. The proposed scheme is a two-layer scheme. At the primary layer, all MSNs are circulated into little clusters, where each cluster is spoken to by a solitary cluster Head (CH). At the second layer, all CHs verify identities of mobile sinks before sharing multimedia data and uses Secured and Authorized Selective Encryption (SEEN) protocol for assuring high data trustworthiness requires that the system satisfies two key security properties: confidentiality and integrity. We propose a Secured and Authorized SEEN method to secure big sensing data streams that satisfies the desired multiple levels of confidentiality and data integrity. We assess the exhibition of the proposed scheme through broad simulation results. The reenactment results demonstrate that the proposed scheme performs better when contrasted with existing state-of-the-art approaches as far as versatility and handshake span. The proposed scheme is likewise dissected as far as validation rate, data newness, and packet conveyance ratio, and has indicated a superior performance.

Index Terms—Big data stream, selective encryption, data confidentiality, data integrity, WMSNs, multimedia, clusters

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CLOUD COMPUTING COMPONENTS, SERVICES, TOOLS AND ITS ROADMAP TO ORGANIZATION

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Abstract—Cloud computing is quickly rising as another worldview for conveying IT benefits as utility-arranged administrations on subscription basis. The first improvement of uses and their organization in Cloud figuring conditions in proficient way is a complex task. It permits renting of IT abilities whether they are framework, stage, or programming applications as administrations on subscription oriented benefits in a compensation as-you-go model. Its establishment depends on different improvements in IT during the last thirty to forty years. As crisp thoughts and innovation headway have made it even more striking and engaging during the Internet age, the manner in which buyers devour and innovation empowering agents convey arrangements has advanced. With a pattern towards Cloud based model, the power is moved to customers. They approach more process control and to new applications, at a charming cost, just as they appreciate the benefits of a self-administration and self managed condition. Here in this paper we elaborately describe about the Cloud computing introduction, components, services, tools used in cloud computing and finally states the roadmap to cloud computing.

Keywords: Cloud Computing, Components, Cloud Architecture, SaaS, PaaS, IaaS, Cloud Computing Tools, Roadmap to Cloud Computing

I. INTRODUCTION

The term "cloud", as utilized in this white paper, seems to have its roots in system charts that spoke to the web, or different pieces of it, as schematic mists. "Cloud computing" was instituted for what happens when applications and administrations are moved into the Web "cloud." Cloud computing isn't something that all of a sudden showed up medium-term; in some structure, it might follow back to when PC frameworks remotely time-shared registering assets and applications. All the more as of now however, distributed computing alludes to the a wide range of kinds of administrations and applications being conveyed in the web cloud, and the way that, much of the time, the gadgets used to get to these administrations and applications try not to require any exceptional applications. Some important examples are as follows:

- Microsoft — Has Microsoft® Office 365® online administration that takes into account substance and business insight instruments to be moved into the cloud and Microsoft as of now makes its office applications accessible in a cloud.
- Salesforce.com — Runs its application set for its clients in a cloud, and its Force.com and Vmforce.com items give engineers stages to construct redid cloud administrations
- Google — has a private cloud that it utilizes for conveying Google Docs and numerous different administrations to its clients, including content interpretations, maps, web investigation, and email get to, archive applications, and considerably more.

A. Characteristics of Cloud Computing

Cloud computing has an assortment of qualities, with the fundamental ones being:

- Shared Infrastructure — uses a virtualized programming model, empowering the sharing of physical administrations, stockpiling, and systems administration abilities. The cloud framework, paying little heed to arrangement model, looks to take advantage of the accessible foundation over various clients.
- Dynamic Provisioning — Allows for the arrangement of administrations dependent on current interest prerequisites. This is done consequently utilizing programming computerization, empowering the extension and withdrawal of administration ability, as required. This dynamic scaling should be done, while keeping up elevated amounts of dependability and security.

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SUSTAINABLE DEVELOPMENT OF UNIVERSAL ELECTRONIC CONTROL UNIT FOR FUEL SAVING IN AUTOMOBILES TO PROTECT THE ENVIRONMENT POLLUTION

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Abstract—The sustainable development of electronic control unit plays a vital role in the development of road vehicles. The proposing system concentrates on fuel savings, Universal Electronic Control unit, LabVIEW programming based Controller Area Network protocol, android mobile based user interface and Image processing based autonomous vehicle. Fuel savings is achieved with the help of ethanol blended fuel. Universal Electronic Control Unit can be fixed into any fuel based engine like battery, diesel, petrol etc. Before fixed into the system the operating modes of the Electronic Control Unit are programmed earlier. NI Data dashboard based control and NI vision acquisition software and vision assistant module based image processing employs the autonomous vehicle. Programming for the proposing system done in LabVIEW platform and cRIO-9022 is used as the main controller. The adaptability of the LabVIEW software allows up gradation of the program and hence, permits the user to customize the Universal Electronic Control Unit to ends needs. 25-30% of fuel consumption is reduced by the ethanol fumigation to protect the environment from pollution and is also implemented Controller Area Network operating with 250k baud rate at 533MHz clock frequency. Rate of NO_x, CO emissions is also reduced because of ethanol fumigation.

Keywords: LabVIEW, cRIO, Controller Area Network, Ethanol Fumigation, Image Processing and Autonomous Driving.

1. Introduction

The electronics in today's vehicles has the larger emissions of fuel cause the environment pollution and large transition from easy components to complex semiconductor chips in interfacing the capability of analog electronics and established the reliability and flexibility of digital electronics. The complexity of electronics for circuit design, processing, power control sensing, signal conditioning and transient suppression are predetermined to improve more in future vehicles. Electronic Engine Management is science of electronically equipping, managing and regulating an engine to preserve the performance and fuel economy while attaining the cleanest exhaust stream and diagnosing system faults.

In automotive electronics, Electronic Control Unit (ECU) is embedded system for handling some electrical system in transport vehicle. ECU comprises the Electronic/engine Control Module (ECM), Powertrain Control Module (PCM), Transmission Control Module (TCM), Brake Control Module (BCM or EBCM), Central Control Module (CCM), Central Timing Module (CTM), General Electronic Module (GEM), Body Control



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SUSTAINABLE DEVELOPMENT OF UNIVERSAL ELECTRONIC CONTROL UNIT FOR FUEL SAVING IN AUTOMOBILES TO PROTECT THE ENVIRONMENT POLLUTION

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Abstract—The sustainable development of electronic control unit plays a vital role in the development of road vehicles. The proposing system concentrates on fuel savings, Universal Electronic Control unit, LabVIEW programming based Controller Area Network protocol, android mobile based user interface and Image processing based autonomous vehicle. Fuel savings is achieved with the help of ethanol blended fuel. Universal Electronic Control Unit can be fixed into any fuel based engine like battery, diesel, petrol etc. Before fixed into the system the operating modes of the Electronic Control Unit are programmed earlier. NI Data dashboard based control and NI vision acquisition software and vision assistant module based image processing employs the autonomous vehicle. Programming for the proposing system done in LabVIEW platform and cRIO-9022 is used as the main controller. The adaptability of the LabVIEW software allows up gradation of the program and hence, permits the user to customize the Universal Electronic Control Unit to ends needs. 25-30% of fuel consumption is reduced by the ethanol fumigation to protect the environment from pollution and is also implemented Controller Area Network operating with 250k baud rate at 533MHz clock frequency. Rate of NO_x, CO emissions is also reduced because of ethanol fumigation.

Keywords: LabVIEW, cRIO, Controller Area Network, Ethanol Fumigation, Image Processing and Autonomous Driving.

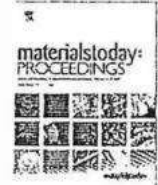
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Power system stability enhancement in two machine system by using fuel cell as STATCOM (static synchronous compensator)

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Currently, our power sector was encountered numerous instability problems namely rotor angle instability, voltage instability and various power quality issues [1–2]. Transient stability analysis one of the main problems for proper functioning of the power systems the stress was rising during the faults [3]. To improve the performance of utility system, it needs an evaluation of system's ability to withstand the disruptions concurrently retaining the service quality [4]. Existing scheme composed of mitigating instability issues to interconnecting FACTS compensators namely conventional STATCOM, IPFC, UPFC, SSSC [5] etc. at the consumer edge applying the principle of distributed energy resources (DERs) by

interconnecting non-conventional energy as input for compensator [1,6]. In this paper Fuel Cell modeled as STATCOM to improve the transient stability of two machine system. The disturbance was formed by applying several types of faults at the transmission line its adversely impact the entire efficiency of the utility systems. This transient instability is controlled by interconnecting Fuel Cell source acting as a STATCOM [2]. FC based STATCOM is a novel method was applied to electrical systems for mitigating the instability issues [3]. FCSTATCOM supplies reactive and real power to the utility over there by mitigating the transient instability issue formed through various faults Table 1.

The STATCOM is defined as static compensator utilized to control voltage and enhance the dynamic stability variations. The common model of a STATCOM which was interconnected to an AC transmission bus bar via a coupling transformer. STATCOM to maintain transient stability with in a permissible voltage for all

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DEVELOPMENT OF SMART ROBOT CAR FOR SURVEILLANCE

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Abstract

The proposed framework has structure and improvement of a brilliant robot vehicle which incorporates remote camera recognizing alive people with sensors for dangerous gases, metal items, obstacles at isolated territories, after sensing it sends data to fundamental area with the assistance of ZigBee module by working either automatically or manually. This robot framework has sensors that can alarm the client when any unusual appearance is found inside the range. This proposed work utilizes machine insight to give quick reaction from the sensors. The conspicuous component of this robot framework that separates it from different gadgets is implementation of flexible tasks in nighttime and harsh regions. This whole robot vehicle framework split into two distinct modes. The principal method is programmed mode and the subsequent mode is manual mode. Right now, development is controlled utilizing hindrance identifying sensor and ultrasonic sensor. In manual mode, client imparts sign to robot vehicle utilizing RF module. The encompassing can be seen and headings can be changed through camera. With the assistance of amplifier in the remote camera, the client could hear the discussion of the people at the fringe regions in both the modes.

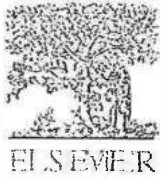
Keywords: ZigBee, PIR sensor, Gas sensor, Proximity sensor, Ultrasonic sensor, Wireless camera, DC motor

1. Introduction:

A robot is only a programmed electronic piece of equipment that is equipped for performing modified exercises along these lines supplanting human work, giving profoundly exact outcomes and effectively conquering confinements of people[1]. Observation is essentially required in the territories, for example, outskirts zones, open spots, workplaces and in enterprises. It is mostly utilized for checking activities. The demonstration of observation can be performed both indoor just as in open air territories by people or with the assistance of installed frameworks, for example, robots and other computerization gadgets. This robot additionally comprises of DC engines, Bluetooth, battery, Zigbee module and different sorts of sensors, for example, ultrasonic sensor for different identification, Proximity sensor for recognizing close by objects, PIR sensor for movement detection[2]. The robot can be worked either consequently or physically. Subsequently supplanting people in the observation fields is one of the extraordinary progressions in applying autonomy. The robot comprises of ZigBee module which goes about as the heart bit of the robot.

2. Proposed System:

The system contains detectors like obstacle detector, gas detector, metal detector and motion detector for inspecting the areas which is prohibited for humans of in desired areas for any specific purpose. The user or controller can operate the robot car in dual options as needed by the user. Those options are automatic and manual; the camera will display the live recordings in the specified location in both the options respectively.



Visualization of virtual environment through labVIEW platform

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ABSTRACT

Virtual instrumentation is the use of customizable software and modular measurement hardware to create user-defined measurement systems, called virtual instruments. The primary difference between hardware instrumentation and virtual instrumentation is that LabVIEW software is used to replace a large amount of hardware. The software enables complex and expensive hardware to be replaced by already purchased computer hardware. Virtual Instrumentation is established using LabVIEW. Laboratory Virtual Instrument Engineering Workbench (LabVIEW) is a system-design platform and development environment for a visual programming language from National Instruments. The graphical language is named "G"; not to be confused with G-code. Originally released for the Apple Macintosh in 1986, LabVIEW is commonly used for data acquisition, instrument control, and industrial automation on a variety of Operating Systems (OSs), including Microsoft Windows, various versions of Unix, Linux, and MacOS. Simple timer Circuit, Traffic Light Control System, Automotive Safety assurance, Speed, Direction control of DC motor and Library Database File Management are realized by implementing VI programs. Select switch, Looping concepts, Case and Flat Sequence structures, String Manipulation, Clusters, File IO systems and Arduino interfacing through DAQ are used to implement all Simulation Models. Software Developed timer circuit and Automotive Safety assurance overcome the accuracy problem of conventional circuits. Designed Library Management system enhances ease of tracking. Conventional control of DC motor relies on hardware accessories such as Field and Armature rheostats and it requires manual implementation, whereas Virtual instrumentation makes software based control and it improves the system reliability. Fetching of Real time data and manipulation addresses the flexibility issue of hardware based Traffic Light Control system.

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1. Introduction

The use of a computer to imitate an instrument or device is known as virtual instrumentation. One software development package used to create virtual instruments is LabVIEW (Laboratory Virtual Instrument Engineering Workbench). LabVIEW is a graphical programming language that, when used in conjunction with a data acquisition device and personal computer, allows the user to control devices, collect, manipulate and display data. Written

code is not used in LabVIEW, instead graphical representations of the circuits are constructed which are called Virtual Instruments (VIs) Fig 1 Table 1.

$$A + b = a + b \quad (1)$$

These VIs are manipulated to perform the desired tasks at hand. The Vis (Virtual Instruments) in LabVIEW are run from their front panels. This is the panel with all of the controls and displays. Each front panel has an associated block diagram. This block diagram is built using the graphical programming language G. Components of the block diagram represent different structures, loops and functions and wiring of the block diagram represents the flow of data

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An Efficient Authentication Scheme for IoT based WBANs

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Abstract—Due to the quick headway of remote advancements, remote body region systems (WBANs) have gotten broad consideration from the general population as of late. IoT-based WBANs are intended to give life support significantly by observing the essential body boundaries and the general situations of human bodies. These sensors gather the constant natural data, for example, circulatory strain, pulse and beat of a patient and afterward send the data through cell phones, for example, an information sink to a distant clinical worker. In light of the got data, the specialists and other clinical specialists can give appropriate diagnostics to the patients. They are utilized to give appropriate and opportune clinical diagnostics and invited method for electronic social insurance frameworks.

Keywords—body-parameters, e-healthcare systems, mobile device, remote medical server, wearable sensors.

1. INTRODUCTION

A body zone systems (BAN), moreover implied as a remote body zone systems (WBAN) or a body sensor systems (BSN) or a clinical body territory systems (MBAN), is a distant arrangement of wearable enrolling devices. Boycott devices may be embedded inside the body, embeds, may be surface-mounted on the body in a fixed position Wearable turn of events or might be went with contraptions which people can pass on in various conditions, in garments pockets, by hand or in different packs.

A WBAN system can use WPAN distant advances as entries to show up at longer ranges. Through entryway devices, it is possible to relate the wearable contraptions on the human body to the web. In this way, supportive pros can get to understanding information electronic using the web self-sufficient of the patient territory.

A WBAN offers new applications in the region of far off medicinal services watching, home/human administrations, sedate, blended media, sports and various other, all of which make piece of space of the unconstrained chance of improvement a WBAN offers. In the restorative field, for example, a patient can be equipped with a far off body zone compose involving sensors that persistently measure unequivocal regular limits, for instance, temperature, circulatory strain, beat, electrocardiogram (ECG), breath, etc.

WBAN system require certain safety efforts to ensure security, protection, information uprightness and secrecy of a patient's wellbeing records at all the occasions. A supporting WBAN framework must execute explicit security activities that assurance these highlights. Security and protection of patient data are the two vital highlights for inside each WBAN framework.

Security refers information is shielded from unapproved clients when being moved, gathered, prepared and remains securely put away. Then again, protection proposes the power to control the social affair and

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Power system stability enhancement in two machine system by using fuel cell as STATCOM (static synchronous compensator)

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A HIGH STEP-UP QUADRATIC BOOST CONVERTER INTEGRATED WITH VOLTAGE MULTIPLIER

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Abstract: An interleaved quadratic boost converter integrated with capacitive voltage multiplier is proposed in this paper. Two quadratic boost switching cells are interleaved to minimize the current ripples in input side. Its output is coupled to a voltage multiplier to increase the static gain, resulting in a higher output voltage with moderate duty cycle. Compared with the conventional boost converter and quadratic boost converter, the proposed converter has reduced voltage stress in the switches and diodes. The detailed analysis of the converter is presented for both continuous. A prototype is simulated and implemented in the laboratory. The results validate the theoretical analysis and confirm the viability and significant performance of the converter. The maximum efficiency of the proposed converter is 91.5 % under full load.

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Key words: DC-DC power converters, distributed power generation, fuel cells, photovoltaic systems, switching converters.

1. Introduction.

A large and sustainable economic growth in India is to develop a great demand for energy resources. There is a risk of increasing in import of oil, creating serious problems for energy security in the future of India. In India, a large proportion of people still live without access to electricity and other forms of commercial energy. More than 50% of the population in India has little or no energy for life and living.

The power generation through photovoltaic panels, and through the fuel cells bring advantages like diversification of energy sources, increased distributed generation and also in services to isolated areas [1,2]. Various applications such as uninterrupted power supply and motor drives, often need to raise a low level of input voltage from batteries, solar panels, fuel cells, small wind generators, and others, to voltage values between 300V and 400V, constituting a DC bus power required for its voltage inverters [3].

The cascading of N conventional boost converters is a practical solution to obtain a high voltage gain with increased power losses. The voltage gain is increased by number of converter stages [4-7]. However, cascaded

topologies are not suitable for high gain applications, because the voltage stress across the power switch and diodes are high which will reduce the efficiency of the converter. In [8,9] the conventional boost converter is combined with multiple switched capacitor cells to obtain a high conversion ratio. Topologies with coupled inductors [10-12] can provide high voltage gain with reduced voltage stress. However, the leakage inductance in the coupled inductors cause high voltage spikes on the switches. In [13-15], the coupled inductors and voltage multiplier cells are integrated with conventional boost converters to obtain large gain. However, the added stage increases the parts count and complexity of the design as well as introducing extra losses related to the multiplier cell. The conventional boost converters are interleaved with a voltage multiplier cell can extend the voltage gain, minimize the input current ripple [16,17]. Thus, an interleaved converter improves the performance, but at the expense of increased size, cost, and control complexity.

This work is a contribution to a new DC-DC converter topology without the use of high-performance switching devices or sophisticated control strategies while preserving a high voltage gain and compatible switching efforts with commercially available components. The proposed converter is obtained by integrating interleaved two quadratic boost cells and voltage multipliers. The principle of operation and analysis of the proposed converter is explained in Section 2 and Section 3. Section 4 gives the design methodology for the proposed converter. Simulated and experimental results are presented in Section 5 and some concluding remarks in Section 6.

2. Interleaved Quadratic Boost Converter Integrated with Voltage Multiplier

The conventional quadratic boost converter with a single active switch, two-phase interleaved boost converter and the voltage multiplier are shown in Figs. 1(a), (b) and (c) respectively.



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A HIGH STEP-UP QUADRATIC BOOST CONVERTER INTEGRATED WITH VOLTAGE MULTIPLIER

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Abstract: An interleaved quadratic boost converter integrated with capacitive voltage multiplier is proposed in this paper. Two quadratic boost switching cells are interleaved to minimize the current ripples in input side. Its output is coupled to a voltage multiplier to increase the static gain, resulting in a higher output voltage with moderate duty cycle. Compared with the conventional boost converter and quadratic boost converter, the proposed converter has reduced voltage stress in the switches and diodes. The detailed analysis of the converter is presented for both continuous. A prototype is simulated and implemented in the laboratory. The results validate the theoretical analysis and confirm the viability and significant performance of the converter. The maximum efficiency of the proposed converter is 91.5 % under full load.

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Key words: DC-DC power converters, distributed power generation, fuel cells, photovoltaic systems, switching converters.

1. Introduction.

A large and sustainable economic growth in India is to develop a great demand for energy resources. There is a risk of increasing in import of oil, creating serious problems for energy security in the future of India. In India, a large proportion of people still live without access to electricity and other forms of commercial energy. More than 50% of the population in India has little or no energy for life and living.

The power generation through photovoltaic panels, and through the fuel cells bring advantages like diversification of energy sources, increased distributed generation and also in services to isolated areas [1,2]. Various applications such as uninterrupted power supply and motor drives, often need to raise a low level of input voltage from batteries, solar panels, fuel cells, small wind generators, and others, to voltage values between 300V and 400V, constituting a DC bus power required for its voltage inverters [3].

The cascading of N conventional boost converters is a practical solution to obtain a high voltage gain with increased power losses. The voltage gain is increased by number of converter stages [4-7]. However, cascaded

topologies are not suitable for high gain applications, because the voltage stress across the power switch and diodes are high which will reduce the efficiency of the converter. In [8,9] the conventional boost converter is combined with multiple switched capacitor cells to obtain a high conversion ratio. Topologies with coupled inductors [10-12] can provide high voltage gain with reduced voltage stress. However, the leakage inductance in the coupled inductors cause high voltage spikes on the switches. In [13-15], the coupled inductors and voltage multiplier cells are integrated with conventional boost converters to obtain large gain. However, the added stage increases the parts count and complexity of the design as well as introducing extra losses related to the multiplier cell. The conventional boost converters are interleaved with a voltage multiplier cell can extend the voltage gain, minimize the input current ripple [16,17]. Thus, an interleaved converter improves the performance, but at the expense of increased size, cost, and control complexity.

This work is a contribution to a new DC-DC converter topology without the use of high-performance switching devices or sophisticated control strategies while preserving a high voltage gain and compatible switching efforts with commercially available components. The proposed converter is obtained by integrating interleaved two quadratic boost cells and voltage multipliers. The principle of operation and analysis of the proposed converter is explained in Section 2 and Section 3. Section 4 gives the design methodology for the proposed converter. Simulated and experimental results are presented in Section 5 and some concluding remarks in Section 6.

2. Interleaved Quadratic Boost Converter Integrated with Voltage Multiplier

The conventional quadratic boost converter with a single active switch, two-phase interleaved boost converter and the voltage multiplier are shown in Figs. 1(a), (b) and (c) respectively.



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Speed-bump Detection using Otsu's Algorithm and Morphological Operation

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ABSTRACT: Driver Assistance System (DAS) is one of the most mandatory subsystems of Intelligent Transport System (ITS). Speed Bump Detection (SBD) is a subset of DAS that supports the driver to recognise the presence of speed bump and alert the driver. Under the critical condition, it has to operate on the vehicle directly for safety. In the research work, two methods of Speed Bump Detection have proposed (i) Otsu's threshold method and (ii) Morphological Operation method. These methods are superior to the existing methods because it does not involve any network, so it is free from GPS error, network overload, delay and false alarm. It also detects the speed bump with low projected where the existing method using sensors fails. The proposed Otsu's method is straight forward, efficient and gives 74.6% accuracy for all types of road condition. The performance of Morphological or structural operation method achieves better result 85.8 % detection ratio. The two proposed methods give more than 90 % detection ratio for properly painted road and optical illusion type speed bump.

Keywords: Advanced Driver Assistance System, Image Processing, Morphological operation, Otsu's Algorithm, Speed-bump Detection.

Abbreviations: A DAS, Advanced Driver Assistance System; VELD, VisLab Embedded Lane Detector; LiDARs, Light Detection and Ranging; OBD, On-board diagnostics; ROI, Region of Interest; SVM, Support Vector Machine; RGB, Red Green Blue; GPS, Global Positioning System; GSM, Global System for Mobile Communications.

I. INTRODUCTION

Speed-bump detection is essential because many accidents are happening due to the sudden intrusion of a speed-bump. An un-notified speed-bump on high speed is harmful to patients in transit like pregnant women [11–12]. It also leads to rapid wear and tear of tyres and even causes damages to the vehicle. The proposed system provides alert to the driver in advance about the presence of a speed-bump or provides signals to the system to work immediately to reduce the vehicle speed.

Speed breakers are built in places like accident-prone locations, sharp curves, congested residential streets, unmanned level crossings where control of speed become necessary to avoid accidents. The speed bumps are formed with various physical identities such as height, length, length of ramps etc. However, in India, it is not the case.

Challenges faced by existing systems are mobile Battery drain out as well as heat due to continuous usage of GPS. GPS error, Network overload and delay have a massive impact on real-time implementation. Involvement of more number of sensor, Processing time and the false Vibration patterns are the difficulties faced by the earlier research work.

II. LITERATURE EXPLORATION

A. Speed-bump Detected using Sensor and Meter

Bret Hull *et al.*, [3] used CarTel - a mobile sensor computing system intended to gather, process, deliver, and visualise sensors data which is a part of mobile units. A CarTel is a mobile embedded processor linked with a collection of sensors. At each node, sensor readings are collected and processed locally before distributing them to a central portal, where the data stored for further analysis and visualisation. The automotive framework includes a variety of onboard and external sensors to collect data. The CarTel had been deployed on six cars, running in Boston and Seattle. It has been used mainly to analyse commute times, analyse metropolitan Wi-Fi distributions, and for automotive diagnostics. The drawback of CarTel is that they do not offer privacy.

Choi, *et al.*, [25] develop an environment-detection and-mapping algorithm for autonomous driving for both rural and off-road real-time environments. Environment-detection-and-mapping algorithms include two parts, (1) using cameras, pedestrian crossing detection, lane detection, and speed-bump detection is implemented, and (2) using LiDARs obstacle on the road was detected. VisLab Embedded Lane Detector (VELD) and a camera are used for lane detection algorithm which returns the lane location. The position of pedestrian

Real-Time Detection of Unmarked Speed Bump for Indian Roads

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Abstract:

One of the important roles of Driver Assistance System (DAS) is to assist the driver by alerting the road anomalies. Detection of the speed bumps/breakers, potholes, and maintenance holes will fall under the road anomalies category. In India, generally there are two types of speed bump: i) marking type speed bump ii) unmarking or non-marking speed bump. Among the two, using image processing technique identification of speed bump in earlier is comparatively easier than the later. Still, it is very challenging to detect the unmarked speed bump since there is no yellow or white stripe to indicate their presence. During driving, the human visual system recognizes the marking type speed bump in long-distance, but it is very tough in the case of unmarked speed bump. So, a new method is proposed to identify the Real-time speed bump. The detection of such type of speed bump is essential for the driver to avoid accidents/inconvenience in driving. In the proposed method, after converting the RGB image into a grayscale image, a Gaussian filter is used to remove the noisy environment in the road image. Followed by Canny edge detection to identify the edges of the image. This helps to locate the edges of speed bump though the colour of road and speed bump remains the same; there is a minute transition between them. Commonly the speed bump is constructed horizontally in the form of the line that can be identified easily using Hough transform. On average, the accuracy ratio of corrected detected speed bump is 95.5%. In addition to driver assistance, the system can also be implemented in self-driving cars.

Introduction:

The dream of an Intelligent Transportation System (ITS) gets fulfilled when the critical component Driver Assistance System gets developed. The objective is to alert or warn the driver when the speed bump is recognized. Sometimes it can work ahead to act directly on the Engine control unit to reduce the vehicle speed automatically for safe driving. The DAS subsystem includes warning system for running away from lane, warning downside-up driving, Traffic sign recognition, Speed bump Detection, Adaptive cruise control (ACC), Driver drowsiness detection, Zebra or predestined crossing, and an automotive navigation system. Obstacle detection in roadside like a speed bump, potholes is also one of the vital research areas for self-driving cars. The speed bump plays the role of sleeping police on roadways to decrease the speed of the vehicle in a restricted area. The restricted area can be a danger zone, accident-prone zone, school zone, hospital and residential space. Detection of marking speed bump is quite easy using Image processing concept. However, detecting the unmarked speed bump is a challenging task not only for the system but also to humanity. Compare to marking speed bump, accident due to unmarked speed bump are very common due to the absence of highlighter on a speed bump. Thus, the main focus of this paper is to develop a system

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Effective Crop Loss Assessment for Picture Based Insurance Claim

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Abstract

Farmers in India are having a lack of awareness and knowledge about the various agricultural-based insurances for their loss/damage to crops. In this paper, we are trying to identify a solution for this issue with a smartphone-based insurance automation system. Providing the right information to the farmers and the regular follow up on the cultivation of the crop is the primary focus on the automation system. Apart from that, the claim for the crop loss or damage caused by the climatic changes has to be updated automatically to the insurance agents to make the farmers get the insurance claims quickly and earlier. For the loss assessment, the pictures taken from the smartphones by the farmers themselves are sufficient if they had followed the regular procedure for uploading the crop field pictures. The system is designed to keep the picture capturing protocol with high accuracy and formulated to estimate the amount of crop loss accurately through the smartphone captured images. Finally, the limitations are analyzed in line with alternative insurance approaches.

Article History

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Keywords: Crop Loss, PBI, Picture Capturing Protocol, Small-Holder Farmers

1. Introduction

The ability to monitor crop development is critical for tracking and controlling agricultural activities. Remote sensing could be used in resolving this issue globally. But this kind of remote monitoring involves satellite imaging, which has the limitations of regular capturing of crop field pictures and will not be suitable for small area agricultural farming [2]. Crop damage events cannot be detected effectively with the help of spatial resolution satellite images. Also, this image information needs some additional data to fill the statistical gaps with high resolution, which are not available for public surveys.

Picture-Based Insurance (PBI) for crops bids a new approach of providing reasonable and easy-to-estimate crop insurance. Farmers can use their smartphone to capture the pictures of crop fields and upload for insurance claiming to minimize the costs of loss verification. Most of the smallholder farmers lack access to affordable insurance [1]. This is because their farms are comparatively too small and far away for insurers to verify the damage on insured crop fields. However, with the technological developments, insurance companies

may not be interested to send an insurance agent to the spot to verify a farmer's claim. They could merely evaluate losses by processing smartphone pictures of damaged crops, taken by farmers themselves, as long as these pictures reliably document crop damage due to a natural tragedy and document that crops were managed properly until that event [6][7].

The limitation found with the Weather index-based Insurance (WBI) is its inability to detect the loss of crop in terms of quantity. This method can be applied only for the large scale farm areas and region-wise insurance claims. Crop damage can be viewed clearly through pictures captured from new smartphones. Farmers can afford a smartphone and able to take pictures of their crop fields [4]. If they take pictures at regular intervals, then the pictures are clearly stating the crop damages visible and quantifiable.

On the other hand, PBI is found more viable for a genuine insurance claim to the small crop fields. This approach can also be extended to large scale farm sectors. This approach will reduce the cost of verification by the insurance markets.

An Implementation of GFDM Transmitter for 5G Waveform Generation

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Abstract- The Generalized FDIM is one of the contenders in the fifth generation of wireless communication systems due to more enhanced properties. One of the objectives of 5G is realizing waveform with less latency for the target of 5ms. So, there is a need for a 5G waveform design with reduced time complexity to provide low latency on waveform generation. In the Orthogonal frequency division multiplexing modulation scheme, the GFDM is used as a generalized form. In GFDM, for a group of symbols, one cyclic prefix is used instead of one cyclic prefix per symbol. It leads to getting more bandwidth efficient than OFDM. To achieve the objectives, we are implementing the transmitter model on SDR (Software Defined Radio) and then verifying various functionalities. This paper proposes a transmitter design which is based on matrix scarification. It is achieved through a Fast Fourier Transform (FFT). This helps the system in reduced complexity. On implementation of the system on SDR, it is found that the complexity of the system can be reduced. Additionally, the proposed algorithms do not provide any performance loss as it gives optimal performance. For the proposed techniques, the computational cost is analyzed and compared with the latest existing solutions. By comparing, it is coming to know that the proposed technique GFDM has the lowest complexity.

Keywords –5G, GFDM, OFDM

I. INTRODUCTION

OFDM has been one of the most popular choices for wired and wireless communication. Fifth-generation wireless communication systems aim at a vast number of applications in the early years, which leads to the necessity of more signaling techniques [7,9]. The proposed signaling techniques should outperform the OFDM in terms of time and frequency. This leads to a large number of waveforms subjected

to the analysis. One of the major drawbacks of OFDM is its large out of band emission which creates interferences. These interferences can influence the signal and can deteriorate the signal or can leak out some information. It also has high sensitivity towards the synchronization errors which may create some amount Carrier Frequency Offset. OFDM is also influenced by the Doppler's Effect (i.e. change in phase) and propagation delays thus, resulting in synchronization errors which can be erroneous for Multiple Users.

There have been many solutions that have been put forward such as use of Filter Banks for Multiple Carriers or using Prototype Filter in order to reduce the synchronous errors while transmitting [8]. However, it has been found that GFDM has various attractive properties and therefore, it has been receiving great amount of attention. GFDM is generalized form of OFDM and therefore contains most of its advantages. The GFDM packet is structured like one cyclic prefix for a group of symbols. It leads to a better channel transient response. Through the bandpass filter, each data symbol over each subcarrier is filtered. The data symbols in each subcarrier are managed by a filter, which produces its frequency response to restricted bandwidth. It is transferred at an interval of T. The subcarrier spacing is set equal to $F = 1/T$.

A trade-off is created between the cyclic prefixes and BER (Bit Error Rate) when it comes to implementation of GFDM. Therefore, an attempt to reduce this trade-off is proposed in our system by implementing the whole system in SDR[10]. This will not only reduce the trade-off between the two parameters but also, can prove beneficial in reduction of system's complexity. The major reason for this degradation is due to non-orthogonal property. This can be removed using various filters like MSME or ZF. But here, we prefer to use an RC filter because it provides with least complexity and they are the ones that can be easily modified and changed according to the desired



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A. Speed-bump Detected using Sensor and Meter
Bret Hull *et al.*, [3] used CarTel - a mobile sensor computing system intended to gather, process, deliver, and visualise sensors data which is a part of mobile units. A CarTel is a mobile embedded processor linked with a collection of sensors. At each node, sensor readings are collected and processed locally before distributing them to a central portal, where the data stored for further analysis and visualisation. The automotive framework includes a variety of onboard and external sensors to collect data. The CarTel had been deployed on six cars, running in Boston and Seattle. It has been used mainly to analyse commute times, analyse metropolitan Wi-Fi distributions, and for automotive diagnostics. The drawback of CarTel is that they do not offer privacy.

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A Review on Block Chain Technology Applications with an Emphasis on Health Care

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Abstract

During this decade, Blockchain has been in the limelight in order to achieve effective security and privacy aspects in various domains. As the technological advancements are expanding in a swift manner, it is critical to maintain efficient transactions among the consumers and financial institutions due to various cybercrimes being held in the recent times. This has paved the path for blockchain technologies to venture into different fields. In this article, firstly, blockchain is described with its necessity. Secondly, it details about the different types of blockchain technologies. Thirdly, discusses the applications of blockchain technology in public and private sectors, namely, health, banking, industry and so on. In this article a review of blockchain technology for various application domain is presented followed by review of blockchain for the healthcare application is presented.

Keywords – Blockchain, public blockchain, private blockchain, blockchain applications, eHealth care, mHealthcare

1. Introduction

In this digital era, blockchain emerged to grab attention of majority of the public due to the introduction of Bitcoins and level of security it promises to offer when compared to the available database systems. A blockchain which is also referred to as distributed ledger, is basically an add-on data structure managed through a set of nodes that do not completely rely on each of them. To paraphrase, nodes within the blockchain concur on a structured set of blocks, where each of them comprising numerous transactions and for this reason blockchain has been considered as a register of structured transactions. In a database perspective, blockchain has been an alternative to distributed transactions management as the nodes keep a copy of the data then agree towards implementing order of transactions [1]. On the contrary, conventional databases believe a trusted background and implement well-recognized concurrency control methodologies to perform transactions. In blockchain systems, blocks include transactions as executed by several other peers within the networks. Furthermore, blocks in the blockchain are coupled with preceding blocks using a chain that is of course a hash illustration of transactions performed until previous block. The chain guarantees reliability of transactions so that every transactions executed prior are not influenced and efforts taken to tamper with any of the transactions or initiating a transaction without Proof-of-Work ends up towards nullifying the chain of hashes. Therefore, transparency and trust are achieved in the blockchain systems which are significant aspects which pushes most of the business organizations to apply blockchain technology within their according operations.

Blockchain system comprises of two primary classes, namely, public blockchain and private or permissioned blockchain. Let us understand both of these types. To begin with public blockchain in which any node is allowed to connect or disconnect from the system, hence the blockchain is completely decentralized which is similar to a peer-to-peer system. To elucidate, bitcoin as a cryptocurrency is well-known to most of them and it is an example of public blockchains. In this, the states

Health Management Of Crop Precision With Smart Farming Technologies Using Iot

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Abstract—In the technology era, updating new technologies is indispensable in the field of agriculture too. Among the various researches performed, providing accurate information about the various environmental factors is essential to provide uninterrupted farming. The previous studies signify the use of a wireless sensor network to collect environmental data from different sensors deployed at various nodes/fields and receiving them through the wireless protocol. This paper depicts various features like vision sensor-based remote-controlled monitoring, moisture and temperature sensing, intruders scaring, security, leaf wetness, and proper irrigation facilities with fertilizer. It makes use of wireless sensor networks for acquiring the soil properties and environmental factors continuously. This acquired data is used to provide continuous monitoring and also to improve performance and yield.

Index Terms—Keywords –Raspberry Pi, GSM module, crop precision, smart farming

I. INTRODUCTION

Agriculture is the primary occupation in India for ages. But now due to the migration of people from rural to urban, there is a hindrance to agriculture. So to overcome this problem smart agricultural techniques using IoT are implemented. This paper includes various features like GPS based remote controlled monitoring, moisture and temperature sensing, intruder scaring, security, leaf wetness, and proper irrigation facilities. It makes use of wireless sensor networks for noting the soil properties and environmental factors continuously. Various sensor nodes are deployed at different locations on the farm. Any remote device or internet services are used for controlling these parameters. The operations are performed by interfacing sensors, Wi-Fi, cameras with Raspberry Pi using the mobile application. This concept can be developed as a product and would be useful for farmers.

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Detection of Abnormalities in Kidneys Using Image Processing

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ABSTRACT

This paper proposes a method to process advanced medical image models that provide the automation of kidneys abnormal detection. In this paper, it has been designed in a way to identify the organ structures based on their features and look for abnormalities using erode and corrode image filling. The proposed method also invokes the segmentation algorithm on rendering filtering process for removal of noise resulting in recognition of image, and then connectivity analysis is performed, which differentiates the relation between neighborhood pixels that is used to detect boundaries. And based on the analysis and classification, we can calculate the desired probabilistic estimations of relevant images. The provoked method enables the increase in automation and higher accuracy of organs from the input stage of MRI datasets. The proposed method is evaluated with the available dataset and it shows a vast improvement in the performance classification.

Key words : Image acquisition, Enhancement, Parameter analysis, Connectivity analysis, Segmentation algorithms, Detection of tumors.

1. INTRODUCTION

Developing a system that supports increased *automation* of kidney detection [1] as well as their abnormalities (tumors, stones, cysts), which is capable of detecting and annotate the RoI [2] and also to annotate the organs and their potential abnormalities in a specific MRI dataset. Here it uses region-oriented segmentation to recognize the image of organs. The histogram values are normalized and the threshold value is fixed. This is followed by segmentation and labeling of the segmented images. Then connectivity analysis is performed to detect boundaries and based on the result, the exact problem can be identified. Image segmentation has been used to find the boundaries or edges between the tissues to find a size measurement and, by the image size declare the abnormalities.

Even though the ultrasound image is very easy and transferable and very protective but due to a large number of noises. It will affect the image. Speckle noise is one of the major noises which affect image processing. Speckle noise will reduce contrast and resolution. It leads to difficulty in

requirement of the automatic segmentation process gets very high.

The segmentation of the kidney and finding the abnormalities can be used in surgical places for the operation called punctures. There are many advancements in computer-aided diagnosis system for the diagnosis of a disease. In this paper, the proposed method invokes the segmentation algorithm on rendering filtering process for removal of noise, resulting in recognition of image, and then connectivity analysis is performed, which differentiates the relation between neighborhood pixels that is used to detect boundaries.

1.1. Problem Statement

A Kidney is a very important organ in the human system. Kidney malfunctioning will threaten human life. It leads to the finding of kidney stone in human life at an early stage is a much more important factor. To remove the kidney stone from the human body, the most important process is to the position the kidney stone in the human body. In the ultrasound image, there will be more speckle noise and the image are in low contrast. Due to the speckle noise, the contrast and resolution of the image will get affected. It leads to the difficulty in finding the boundary of an image. In the ultrasound image, the boundary resolution is very low. This leads to the find the abnormality of small stones in the kidney for doctors. To address this issue, the modified image segmentation algorithm has been proposed.

2. BLOCK DIAGRAM

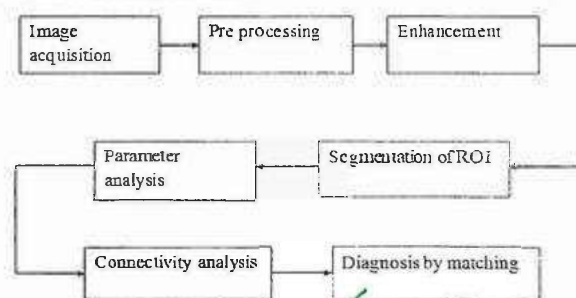


Figure 1: Schematic procedure for the detection of abnormalities.



Deep learning based modulation classification for 5G and beyond wireless systems

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Abstract

The 5G and beyond wireless networks will be more dynamic and heterogeneous, which needs to work on multistrand waveforms. One of the most significant challenges in such a dynamic network, especially non-cooperated cases, is the identification of particular modulation type, which the transmitter uses at the given time to decode the data successfully. This research proposes a modulation classification algorithm using the combination architectures of modified convolutional neural network. The proposed deep learning architecture is developed by combining the convolutional neural network, dense network, and long short-term memory network (LSTM), which is named as convolutional LSTM dense neural network (CLDNN). Moreover, the mean cumulative sum metric (MCS) is introduced in the pooling layer for improved classification accuracy. Dimensionality reduction through Principal Component Analysis is also applied to minimize the training time, so that the proposed architecture can be adopted for its practical usage. The simulation results prove that the presented CLDNN outperforms an ordinary CNN, while taking less training time.

Keywords Convolutional neural network · Dense network · LSTM · Modulation classification

1 Introduction

Automatic modulation classification is used at the receiver to classify the modulation type of the signal that was

transmitted. Typical modulation classification requires expert signal processing algorithms that perform noise reduction and estimation of signal parameters, namely, carrier frequency and signal power. In general, the classification algorithms can be of

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- Likelihood based (LB)
- Feature based (FB)
- Artificial Neural Networks based

In LB [22, 25, 26] and FB [6, 9, 27] techniques, the decision threshold is chosen manually, while in the Artificial Neural Network based techniques [15, 16, 19], the threshold is determined adaptively and automatically. In other words, LB algorithms compare the likelihood ratio of each possible hypothesis against a threshold, which is derived from the probability density function of the observed wave.

The deep neural networks, which is built in terms of Convolutional Neural Network (CNN) can successfully classify various numbers of modulation types [20]. The performance characteristics of CNN not only gives better accuracy, but is also flexible in detecting the various modulation types compared to other approaches. Moreover, deep learning applications show remarkable progress in image recognition, 3D action recognition [11], node localization and classification problems. To further the

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Data-Driven Methods for Next Generation of Wireless Communication Networks

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ABSTRACT

The next generation of wireless communications networks will be very complex with the heterogeneous nature of nodes, radio access mechanisms, communication links, and network slices. The network will be more dynamic, which requires an intelligent system to address those complex heterogeneous scenarios and to adapt to the dynamics of wireless channels and environments. Machine Learning (ML) and Deep Learning (DL)-based solutions will be the optimal one for this problem. Machine learning and Deep learning driven algorithms can facilitate to analyze and make efficient resource management.

Key words : data-driven method, deep learning, end-to-end Learning, machine learning, wireless communication

1. INTRODUCTION

Cognitive RADIO (CR) is used to understand and respond to society through the use of radios. The growing demand for wireless bandwidth in the radio spectrum plays a significant part in automatic signal detection and modulation recognition. The modulation model and estimated signal parameters within the operating streams will thus be specified by users and can help reconfigure a link and calculate the electromagnetic environment. It is also widely used both in military and civil applications that have attracted a lot of attention decades ago. The identification of multi-signals is a function to locate current signals within particular broadband, one of the critical components of CR. Energy is an essential difference between signal and non-signal. As a consequence, several broadband algorithms focused on the power detector (ED) multi-signal identification.

Machine learning, soft computing, and deep learning mechanisms are applied to wireless communication for improved efficiency [19-22]. Excellent anti-noise efficiency is accomplished by high-order, statistically dependent algorithms, such as signal high-order cumulative and cyclic continuum. These methods have a relatively low computational complexity, but the selection of features relates too much to experienced experts. Attributes that can be adjusted to non-ideal environments are challenging to

acquire. Especially as several modulation formats need to be categorized, it is difficult to set the decision threshold.

Deep Learning (DL) has made remarkable milestones with computer vision (CV) and Natural Language Processing (NLP) due to its high ability to understand itself. Increasing numbers of scholars have used DL methods to deal with signal processing issues. Throughout the narrowband method, several DL-based signal recognition strategies were used. These methods only detect signals and thus can not calculate associated parameters. It is a daunting challenge to devise a technique that draws on profound information to distinguish signals consistently and effectively.

The use cases/applications of the machine and deep learning for wireless communication are summarized below

- A) Signal Detection/Classification Using ML/DL
- B) End-to-End Learning of Communications Systems
- C) Channel Estimation Using ML/DL
- D) Resource Allocation Using ML/DL

The popularity of the wireless program DL is attributed to three correlations between DL and the human intellect. 1. Incomplete or even wrong data entry resistance, 2. Ability to handle a large number of inputs: 3. The freedom to rely on decisions

2. SIGNAL DETECTION/CLASSIFICATION USING ML/DL

The trained deep neural network takes less time and ability to provide reliable signal detection as compared to traditional detection mechanism, which involves the iterative, algorithmic signal sample search, and detection [12]. In wireless networks, DL plays a significant role in the physical layer (PL). For example, due to the thorough study of the dynamic radio conditions involving exposure to the spectrum, interference propagation, node stability, device types, etc., the DL may help decide the most effective modulation/en coding schemes.

Interference coordination and jamming resistance in wireless networks are two of the most challenging problems in consideration of the vast number of routers, node stability, channel state variation, and dynamical use of frequencies. DL is the best method for dealing with dynamic challenges

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Effective Crop Loss Assessment for Picture Based Insurance Claim

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Article Info

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Abstract

Farmers in India are having a lack of awareness and knowledge about the various agricultural-based insurances for their loss/damage to crops. In this paper, we are trying to identify a solution for this issue with a smartphone-based insurance automation system. Providing the right information to the formers and the regular follow up on the cultivation of the crop is the primary focus on the automation system. Apart from that, the claim for the crop loss or damage caused by the climatic changes has to be updated automatically to the insurance agents to make the formers get the insurance claims quickly and earlier. For the loss assessment, the pictures taken from the smartphones by the formers themselves are sufficient if they had followed the regular procedure for uploading the crop field pictures. The system is designed to keep the picture capturing protocol with high accuracy and formulated to estimate the amount of crop loss accurately through the smartphone captured images. Finally, the limitations are analyzed in line with alternative insurance approaches.

Article History

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Keywords: Crop Loss, PBI, Picture Capturing Protocol, Small-Holder Farmers

1. Introduction

The ability to monitor crop development is critical for tracking and controlling agricultural activities. Remote sensing could be used in resolving this issue globally. But this kind of remote monitoring involves satellite imaging, which has the limitations of regular capturing of crop field pictures and will not be suitable for small area agricultural farming [2]. Crop damage events cannot be detected effectively with the help of spatial resolution satellite images. Also, this image information needs some additional data to fill the statistical gaps with high resolution, which are not available for public surveys.

Picture-Based Insurance (PBI) for crops bids a new approach of providing reasonable and easy-to-estimate crop insurance. Farmers can use their smartphone to capture the pictures of crop fields and upload for insurance claiming to minimize the costs of loss verification. Most of the smallholder farmers lack access to affordable insurance [1]. This is because their farms are comparatively too small and far away for insurers to verify the damage on insured crop fields. However, with the technological developments, insurance companies

may not be interested to send an insurance agent to the spot to verify a farmer's claim. They could merely evaluate losses by processing smartphone pictures of damaged crops, taken by farmers themselves, as long as these pictures reliably document crop damage due to a natural tragedy and document that crops were managed properly until that event [6][7].

The limitation found with the Weather index-based Insurance (WBI) is its inability to detect the loss of crop in terms of quantity. This method can be applied only for the large scale farm areas and region-wise insurance claims. Crop damage can be viewed clearly through pictures captured from new smartphones. Farmers can afford a smartphone and able to take pictures of their crop fields [4]. If they take pictures at regular intervals, then the pictures are clearly stating the crop damages visible and quantifiable.

On the other hand, PBI is found more viable for a genuine insurance claim to the small crop fields. This approach can also be extended to large scale farm sectors. This approach will reduce the cost of verification by the insurance markets.

REAL-TIME DETECTION OF UNMARKED SPEED BUMP FOR INDIAN ROADS

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Abstract:

One of the important roles of Driver Assistance System (DAS) is to assist the driver by alerting the road anomalies. Detection of the speed bumps/breakers, potholes, and maintenance holes will fall under the road anomalies category. In India, generally there are two types of speed bump: i) marking type speed bump ii) unmarking or non-marking speed bump. Among the two, using image processing technique identification of speed bump in earlier is comparatively easier than the later. Still, it is very challenging to detect the unmarked speed bump since there is no yellow or white stripe to indicate their presence. During driving, the human visual system recognises the marking type speed bump in long-distance, but it is very tough in the case of unmarked speed bump. So, a new method is proposed to identify the Real-time speed bump. The detection of such type of speed bump is essential for the driver to avoid accidents/inconvenience in driving. In the proposed method, after converting the RGB image into a grayscale image, a Gaussian filter is used to remove the noisy environment in the road image. Followed by Canny edge detection to identify the edges of the image. This helps to locate the edges of speed bump though the colour of road and speed bump remains the same; there is a minute transition between them. Commonly the speed bump is constructed horizontally in the form of the line that can be identified easily using Hough transform. On average, the accuracy ratio of corrected detected speed bump is 95.5%. In addition to driver assistance, the system can also be implemented in self-driving cars.

Introduction:

The dream of an Intelligent Transportation System (ITS) gets fulfilled when the critical component Driver Assistance System gets developed. The objective is to alert or warn the driver when the speed bump is recognised. Sometimes it can work ahead to act directly on the Engine control unit to reduce the vehicle speed automatically for safe driving. The DAS subsystem includes warning system for running away from lane, warning downside-up driving, Traffic sign recognition, Speed bump Detection, Adaptive cruise control (ACC), Driver drowsiness detection, Zebra or predestines crossing, and an automotive navigation system. Obstacle detection in roadside like a speed bump, potholes is also one of the vital research areas for self-driving cars. The speed bump plays the role of sleeping police on roadways to decrease the speed of the vehicle in a restricted area. The restricted area can be a danger zone, accident-prone zone, school zone, hospital and residential space. Detection of



Speed-bump Detection using Otsu's Algorithm and Morphological Operation

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ABSTRACT: Driver Assistance System (DAS) is one of the most mandatory subsystems of Intelligent Transport System (ITS). Speed Bump Detection (SBD) is a subset of DAS that supports the driver to recognise the presence of speed bump and alert the driver. Under the critical condition, it has to operate on the vehicle directly for safety. In the research work, two methods of Speed Bump Detection have proposed (i) Otsu's threshold method and (ii) Morphological Operation method. These methods are superior to the existing methods because it does not involve any network, so it is free from GPS error, network overload, delay and false alarm. It also detects the speed bump with low projected where the existing method using sensors fails. The proposed Otsu's method is straight forward, efficient and gives 74.6% accuracy for all types of road condition. The performance of Morphological or structural operation method achieves better result 85.8 % detection ratio. The two proposed methods give more than 90 % detection ratio for properly painted road and optical illusion type speed bump.

Keywords: Advanced Driver Assistance System, Image Processing, Morphological operation, Otsu's Algorithm, Speed-bump Detection.

Abbreviations: A DAS, Advanced Driver Assistance System; VELD, VisLab Embedded Lane Detector; LIDARs, Light Detection and Ranging; OBD, On-board diagnostics; ROI, Region of Interest; SVM, Support Vector Machine; RGB, Red Green Blue; GPS, Global Positioning System; GSM, Global System for Mobile Communications.

I. INTRODUCTION

Speed-bump detection is essential because many accidents are happening due to the sudden intrusion of a speed-bump. An un-notified speed-bump on high speed is harmful to patients in transit like pregnant women [11-12]. It also leads to rapid wear and tear of tyres and even causes damages to the vehicle. The proposed system provides alert to the driver in advance about the presence of a speed-bump or provides signals to the system to work immediately to reduce the vehicle speed.

Speed breakers are built in places like accident-prone locations, sharp curves, congested residential streets, unmanned level crossings where control of speed become necessary to avoid accidents. The speed bumps are formed with various physical identities such as height, length, length of ramps etc. However, in India, it is not the case.

Challenges faced by existing systems are mobile Battery drain out as well as heat due to continuous usage of GPS. GPS error, Network overload and delay have a massive impact on real-time implementation. Involvement of more number of sensor, Processing time and the false Vibration patterns are the difficulties faced by the earlier research work.

II. LITERATURE EXPLORATION

A. Speed-bump Detected using Sensor and Meter
Bret Hull *et al.*, [3] used CarTel - a mobile sensor computing system intended to gather, process, deliver, and visualise sensors data which is a part of mobile units. A CarTel is a mobile embedded processor linked with a collection of sensors. At each node, sensor readings are collected and processed locally before distributing them to a central portal, where the data stored for further analysis and visualisation. The automotive framework includes a variety of onboard and external sensors to collect data. The CarTel had been deployed on six cars, running in Boston and Seattle. It has been used mainly to analyse commute times, analyse metropolitan Wi-Fi distributions, and for automotive diagnostics. The drawback of CarTel is that they do not offer privacy.

Choi, *et al.*, [25] develop an environment-detection and-mapping algorithm for autonomous driving for both rural and off-road real-time environments. Environment-detection-and-mapping algorithms include two parts, (1) using cameras, pedestrian crossing detection, lane detection, and speed-bump detection is implemented, and (2) using LIDARs obstacle on the road was detected. VisLab Embedded Lane Detector (VELD) and a camera are used for lane detection algorithm which returns the lane location. The position of pedestrian

Health Management Of Crop Precision With Smart Farming Technologies Using Iot

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Abstract—In the technology era, updating new technologies is indispensable in the field of agriculture too. Among the various researches performed, providing accurate information about the various environmental factors is essential to provide uninterrupted farming. The previous studies signify the use of a wireless sensor network to collect environmental data from different sensors deployed at various nodes/fields and receiving them through the wireless protocol. This paper depicts various features like vision sensor-based remote-controlled monitoring, moisture and temperature sensing, intruders scaring, security, leaf wetness, and proper irrigation facilities with fertilizer. It makes use of wireless sensor networks for acquiring the soil properties and environmental factors continuously. This acquired data is used to provide continuous monitoring and also to improve performance and yield.

Index Terms—Keywords –Raspberry Pi, GSM module, crop precision, smart farming

I. INTRODUCTION

Agriculture is the primary occupation in India for ages. But now due to the migration of people from rural to urban, there is a hindrance to agriculture. So to overcome this problem smart agricultural techniques using IoT are implemented. This paper includes various features like GPS based remote controlled monitoring, moisture and temperature sensing, intruder scaring, security, leaf wetness, and proper irrigation facilities. It makes use of wireless sensor networks for noting the soil properties and environmental factors continuously. Various sensor nodes are deployed at different locations on the farm. Any remote device or internet services are used for controlling these parameters. The operations are performed by interfacing sensors, Wi-Fi, cameras with Raspberry Pi using the mobile application. This concept can be developed as a product and would be useful for farmers.

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Low Power High Speed Estimated Reconfigurable Multiplier for Multimedia Signal Processing

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Abstract— Rapid development of VLSI design, the logic gates and arithmetic circuits plays important role in signal, image, video and microprocessor applications. A challenging problem in hardware design is to develop hardware efficient, high speed and low power design. Multiplication is one of the arithmetic operations for such applications. Most of the existing multipliers satisfy single requirement, but the time delay and power consumption are very essential requirements for such applications. In this paper, we propose an approximate reconfigurable (AR) multiplier obtained by scaling the input operands. The objective of proposed AR multiplier is to enhance the speed and power consumption at the price of low hardware cost. The scaling logic is used to compute the least significant part of the result is kept in a steady state, as the adders input do not change; the switching activity of this logic is 0, while the unfrozen part of the adder still has a switching activity. Moreover, AR multiplier with the n-bit operation is designed by the canonical signed-digit (CSD) technique for reducing number of adders/shifters in the design. The implementation of the proposed AR multiplier is evaluated by comparing its performance with state-of-art multipliers in terms of hardware utilization, maximum clock frequency and power consumption.

Key words: Reconfigurable Design, Low Power, Approximate Reconfigurable Multiplier, Scale Logic, Multimedia Signals

I. INTRODUCTION

In the recent years, power efficiency has emerged as one of the most critical goals of hardware design [1]. Enormous efforts have already been devoted to improve the power consumption in various levels from algorithmic and software level down to circuit and transistor level. Emerging applications in digital signal processing [2], computer vision [3], and machine learning [4] have created power consumption challenges due to their high computational demands. At the same time, these applications also afford new opportunities for novel low-power implementations. In particular, the common feature of these application domains is an inherent tolerance for limited and insignificant inaccuracies. This inherent error tolerance can be exploited using approximate computing, which effectively allows designers to trade off computational accuracy for savings in power consumption and computational complexity. Arithmetic units such as adders and multipliers constitute the main units of DSPs. An extensive research has been conducted on approximate adders [5]–[7]. The statistically longest carry chain in an n-bit adder is $\log_2 n$, and produced a fast approximate implementation limiting the carry propagation [5]. An approximate adder design has been proposed in [7] comprising two partitions, an accurate and an inaccurate one. However, research activities on approximate

multipliers are limited mainly due to their increased circuit complexity.

Arithmetic computing [8] is very important in the design of digital processors and application oriented systems. Arithmetic unit such as adder, multiplier and divider are the basic key components in digital circuits. Approximate multipliers are the core components of arithmetic circuits and it has extremely high demand on its performance and low power consumption. It is difficult for the multipliers to improve performance and also to reduce power consumption with full accuracy. So, we need to design much error tolerant application such as multimedia and image processing application by approximate multipliers [9]. Approximate computing can improve performance and energy efficiency with reduced design complexity for many error tolerant applications in arithmetic operation. Arithmetic circuits are the building blocks for the error resilience system and approximate design in recent research, without affecting the performance of the end user. The critical requirement in digital signal processing is minimizing delay, power consumption and significantly improves the performance of the processor. There are different levels of design hierarchy for reducing energy consumption and area with better accuracy using approximate digital circuits design [10]. The planned theoretical modeling of elliptic curve scalar multiplier [11] on LUT-based FPGAs primitives employed in elliptic curve scalar multiplier architecture (ECSMA) executed on k input lookup table (LUT)-based field-programmable gate arrays to approximate the delay of dissimilar feature. The elliptic curve point multiplication [12] is based on digit-serial binary field operations. A high-speed point multiplier is used for elliptic curve cryptography by means of either field programmable gate array or application-specified integrated circuit technology. Montgomery decrease and the Karatsuba multiplication algorithms [13] in order to decrease the computational complexity and raise the potential of parallel processing. This algorithm is very successfully employed in multiprocessor environment for hardware and software implementations. Multiplier is based on an area-time-efficient systolic structure over $GF(2^m)$ [14] based on irreducible all-one polynomial (AOP) was offered.

II. RELATED WORKS

In this section, we describe some prior research that focuses on approximate multiplier design as they relate to our proposed approach in approximate computing. Jiang et al. [21] have proposed an approximate design of a Booth multiplier based on an approximation scheme that deals not only with the partial product accumulation, but also with the generation of recoded multiplicands. A 2-bit approximate recoding adder is initially designed to reduce the additional delay encountered in previous radix-8 schemes, thereby

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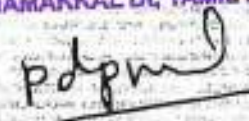
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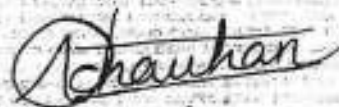
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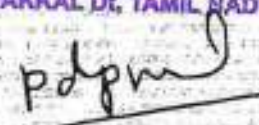
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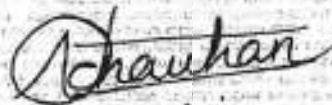
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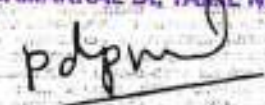


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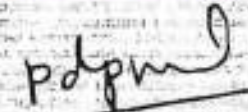
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EXECUTIVE-EDITOR

Research Article

Numerical analysis of fluid flow and heat transfer in single tube fin arrangement of an automotive radiator

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Abstract

This paper deals with CFD analysis of the fluid flow and the heat transfer of the automobile radiator. Normally existing radiator has multi tube fin arrangement. In those tubes a spring is inserted to delay the flow of the fluid thus it transfers more amount of heat. In this arrangement the water from the engine flow through these tubes and get cooled. Here the heat transfer takes place only the peripheral surface which is contact with the fins only. To increase the heat transfer rate the multi tube of the radiator arrangement is replaced by a single plate tube with wire mesh arrangement. Wire mesh arrangement is used to delay the fluid flow thereby increasing the heat transfer rate. The heat transfer of the existing radiator is 20.57W and the proposed design has 77.13W where the heat transfer rate is increased by 3.74 times.

Keywords: Radiator, Multi tube, Single tube, Heat transfer, Convection

1. Introduction

An automobile engine temperature is to be controlled by a cooling system, as very higher temperature reduces the engine performances. An exhaust temperature from 1500 to 2000 °C can oxidizes the film of the lubricating oil and seizes the engine. Moreover, large temperature differences may setup thermal stresses and reduces the thermal efficiency too. An efficient cooling system in automobile removes not more than 30% of the heat generated in the combustion chamber such that excess cooling reduces the thermal efficiency of the engine. During cold starting, initial heat is required for the different working parts of engine to reach their operating temperature quickly.

In the current study a tube fin arrangement of an existing radiator is analysed for evaluating the fluid flow and heat transfer characteristics. The overall pressure, temperature and mass flow rate distribution of the coolant and air in and around the single tube-fin arrangement with 100 fins are evaluated. The fluid flow simulation is conducted using commercial software FLUENT. The pressure and temperature distribution along the tube length and tube width are presented and analysed. The results obtained serve as good database for the future investigations.

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The radiator of a commercially existing vehicle is chosen for the analysis to bring in the practicality to the study. The details of the geometry of the radiator were obtained by the process of reverse engineering. The dimensions of individual components of the radiator were measured using suitable measuring instruments. The measurements obtained were used to generate the CAD model in PTC Creo 4.0.

1.1 Heat Transfer

Flow of heat from high temperature region to low temperature region is called heat transfer. Generally heat can transfer was classified into three ways. They are

- Conduction
- Convection
- Radiation

1.1.1 Conduction: It is a mode of heat transfer occurred between same medium. It is determine by "Fourier's law of conduction". This law states that the rate of heat transfer directly proportional to the negative gradient in the temperature and to the area at right angles to that gradient, through which heat flows. Heat transferred in a one dimensional plane is expressed by follow equation.

$$q = -k(dt/dx)$$

The negative sign in the above formula denotes that the heat was transferred from high heat region to low heat region.

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HEAT TRANSFER AND FRICTION FACTOR CHARACTERISTICS OF PIPE-IN-PIPE HEAT EXCHANGER FITTED WITH VARIANT PLAIN TAPE INSERT

by

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The heat exchanger is used to transfer heat between the fluids without mixing them for both cooling and heating processes. Normally the fluids are separated by a solid wall or tube that is made of different materials in order to avoid mixing. The performance of a heat exchanger is predicted on the basis of heat transfer rate. Many new techniques are being explored by industries to improve the heat transfer rate of heat exchangers. In this work, a double tube heat exchanger is used for studying the variation in heat exchange by inserting a flat tape with different geometries: plain tape, plain tape step cut arc, and plain tape step cut rectangle. Experiments are carried out by varying pressure of hot water and the evaluation is done for different mass-flow rates with inlet temperatures of hot and cold water at 53 °C and 30 °C, respectively, under counter-flow arrangements. The experimental results revealed that the plain tape inserts in counter-flow arrangements enhance heat transfer rate substantially thereby increasing the effectiveness of the system for a marginal increase in pressure drop.

Key words: double tube heat exchanger, plain tape, plain tape-step cut arc, plain tape-step cut rectangle, Nusselt number, Reynolds number

Introduction

Heat exchanger interchanges the heat among fluids of various temperatures, which are separated by a solid wall or any other medium. In the utilization of thermal energy, it is very important to control the temperature of the incoming and outgoing fluid streams. The temperature gradient or the differences in temperature facilitate the transfer of heat. Transfer of heat could occur through either of the three heat transfer principles: radiation, conduction, and convection. Conduction takes place as the heat from the fluid at elevated temperature passes through the solid wall. The wall must be thin and fabricated from a completely conductive material to increase the heat transfer rate. Convection plays the most important role in the

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INVESTIGATION OF MECHANICAL PROPERTIES ON JUTE FIBER-EPOXY REINFORCED COMPOSITES USING TAGUCHI METHOD

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Abstract

Natural fibers are low cost, light weight and it seems that environmentally superior to the synthetic fibers in composites. In this present investigation focus on mechanical properties of natural jute fiber composites. Jute fiber composites are used as natural fiber reinforcement and epoxy resin as matrix. In order to get better interfacial bonding between fiber and matrix by the extracted jute fibers from jute husk are chemically treated. The prepared composites are randomly orientated fibers with different proportions of fibers and matrix ratio. The impact and hardness tests are performed and the results are reported. The results showed that the fiber volume fraction and composite post curing time increases with the mechanical properties of the composite increased. In addition Taguchi analysis is performed for optimization of single response problem.

Keywords: Natural jute fibers, Impact test, Hardness test, Taguchi Method.

1. INTRODUCTION

The development of natural fiber composites concentration was increased to the fast growth and used as reinforcement. Natural composite fibers are an alternate source to synthetic fibers as reinforcement for polymeric materials for the manufacturer of renewable and environmentally friendly composites. The waste plastics have caused unbearable stress to environment in recent years. Environmental knowledge, new rules and legislations were forcing industries to search for new materials which are more environmentally welcoming. Natural plant fibers from agricultural crops were renewable materials which had potential for creating green products and replacing synthetic materials which were currently being used such as glass fiber, carbon fiber and plastic fibers. The combinations of bio-fiber and bio-polymer could be the products of fully biodegradable composite materials [1]. Among others, natural fibers (e.g., flax, jute or sisal) reinforced materials has important meaning for reduction of density in automobile components owing to its high stiffness and strength. The several attempts were conducted by the researchers to utilize natural fibers in the production of composite materials. They have been found that the natural fiber-reinforced composites have better electrical resistance, chemical resistance, good thermal and acoustic insulating properties the increasing attention in introducing degradable, renewable, and inexpensive reinforcement materials which have been environment friendly. The low cost, less weight and density makes the natural fibers an attractive alternative. Among all the natural fiber-reinforcing materials, jute is the most useful, inexpensive and commercially available fibers. In the literature it has been documented that the jute fibers can be used as

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DESIGN AND ANALYSIS OF HYBRID COPPER MATRIX COMPOSITES SYNTHESIZED BY POWDER METALLURGY

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ABSTRACT

The paper deals with comprises of manufacturing hybrid copper matrix composites by using powder metallurgy process. The hybrid copper matrix composites are prepared by compacting and conventional sintering. The copper was selected as a metal matrix to improve thermal and electrical conductivity, protect against corrosion and good wear resistant. Mostly copper are used in wide range of electrical application. Powder metallurgy process improve mechanical wear characteristics. The composition of copper with titanium diboride and graphite. The specimen are in the ratio of [Cu-100%], [Cu-90%, TiB₂-9%, Gr-1%], [Cu-90%, TiB₂-7%, Gr-3%], [Cu-90%, TiB₂-5%, Gr-5%]. The above mentioned specimen are prepared by powder metallurgy process and taking their properties by using analysis the deformation, the equivalent stress and strain are analysed.

KEYWORDS: Powder metallurgy, compacting, sintering, Ansys, Deformation, stress and strain.

I. INTRODUCTION

Copper has excellent electrical and thermal conductivities. Pure copper is mostly used in electrical wire, cable and other parts required to pass electrical current. Because of their outstanding ability to withstand corrosion and also used for pipes, valves, fitting system for carrying water, other aqueous fluid and also industrial gases. The specimen base metal are chosen as copper to reduce metal deformation and increase high strength.

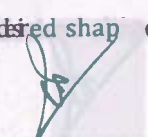
Many researches attempted aluminium with TiB₂ and graphite. Results will be less mechanical behaviours. So TiB₂ and Gr made mixture with copper, reinforcement materials produced in solid & liquid phase method. It has good electrical and thermal conductivity, good resistance and excellent chemical stability.

Graphite are chosen as solid lubricant to improve mechanical properties. It is classified to the group of advanced materials the most bonding resistant. Their bonding is most often carries out by adhesive bonding and vacuum brazing. As brazing, it is required to activate interfaces of materials and to use active filler metals with temperature rises, mechanical strength of graphite increases and reaches the highest strength of all known materials in the range between 200-2500°C. Graphite based composite materials has high mechanical properties than polycrystalline graphite.

In powder metallurgy process mixing raw powder metals with suitable percentage, second step is compacting under high pressure the mixer powder are formed as required shape. Third step is sintering the composite metal with suitable temperature to strengthen the materials.

II. EXPERIMENTAL SETUP

Powder metallurgy process is blending fine powdered materials and make desired shape by compacting and strength by sintering process.


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DESIGN AND PERFORMANCE ANALYSIS OF P2H ELECTRIC VEHICLE (PORSCHE HYBRID ELECTRIC TWO WHEELER)

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ABSTRACT

In today fast developing world, air pollution is rapidly increasing and affecting the world. These increased is mainly due to the emission of carbon dioxide and other toxic gases from the vehicle which leads to gradual increasing in global warming and also demand for utilization of fossil fuels. In order to overcome and minimize these criteria Hybrid engines were introduced. Hybrid electric vehicle (HEVs) which combine an internal combustion engine and one or more electric motors.

HYBRID ELECTRIC VEHICLE is a combination internal combustion engine and electric propulsion system. HEV can be driven on I.C.engine as well as on electric power. In this paper discuss about to the Hybrid two-wheeler (P2H vehicle) with automatic rechargeable battery system by using engine dynamo magnetic power.

KEYWORDS: Hybrid vehicle, Fabrication, Automobile efficiency

I. INTRODUCTION

Air pollution from motor vehicles and exhaustion of natural resources has become a serious global and environmental hazard. Another serious environmental issue is urban warming, caused by concentrated consumption of energy in the urban areas. In India, emission from two-wheelers is a significant contributor to air quality problems. In urban areas in particular, two-wheelers serve as a primary transportation option both due to their relative affordability and their ability to maneuver in heavy traffic. Due to the phenomenal increase in the number of vehicles and the limited use of emission control strategies, two-wheelers are considered to be a significant source of urban air pollution in most of the Indian cities.

Electric and gasoline powered motorcycles of the same size and weight are roughly comparable in performances. A high-end electric motorcycle as faster and better handling than any conventionally powered bike. Electric machine has better acceleration, since the develop full torque. At high speed the whine of an electric motorcycle is said to sound like a space ship.

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INVESTIGATION OF MECHANICAL PROPERTIES ON JUTE FIBER-EPOXY REINFORCED COMPOSITES USING TAGUCHI METHOD

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Abstract

Natural fibers are low cost, light weight and it seems that environmentally superior to the synthetic fibers in composites. In this present investigation focus on mechanical properties of natural jute fiber composites. Jute fiber composites are used as natural fiber reinforcement and epoxy resin as matrix. In order to get better interfacial bonding between fiber and matrix by the extracted jute fibers from jute husk are chemically treated. The prepared composites are randomly orientated fibers with different proportions of fibers and matrix ratio. The impact and hardness tests are performed and the results are reported. The results showed that the fiber volume fraction and composite post curing time increases with the mechanical properties of the composite increased. In addition Taguchi analysis is performed for optimization of single response problem.

Keywords: Natural jute fibers, Impact test, Hardness test, Taguchi Method.

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The development of natural fiber composites concentration was increased to the fast growth and used as reinforcement. Natural composite fibers are an alternate source to synthetic fibers as reinforcement for polymeric materials for the manufacturer of renewable and environmentally friendly composites. The waste plastics have caused unbearable stress to environment in recent years. Environmental knowledge, new rules and legislations were forcing industries to search for new materials which are more environmentally welcoming. Natural plant fibers from agricultural crops were renewable materials which had potential for creating green products and replacing synthetic materials which were currently being used such as glass fiber, carbon fiber and plastic fibers. The combinations of bio-fiber and bio-polymer could be the products of fully biodegradable composite materials [1]. Among others, natural fibers (e.g., flax, jute or sisal) reinforced materials has important meaning for reduction of density in automobile components owing to its high stiffness and strength. The several attempts were conducted by the researchers to utilize natural fibers in the production of composite materials. They have been found that the natural fiber-reinforced composites have better electrical resistance, chemical resistance, good thermal and acoustic insulating properties the increasing attention in introducing degradable, renewable, and inexpensive reinforcement materials which have been environment friendly. The low cost, less weight and density makes the natural fibers an attractive alternative. Among all the natural fiber-reinforcing materials, jute is the most useful, inexpensive and commercially available fibers. In the literature it has been documented that the jute fibers can be used as



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Title: An attempt to enhance the time of reply for web service composition with QoS

Authors: S. Karthikeyan; **P. Meenakshi Dev**

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Abstract: The web services are the commonly prevailing service clusters of the service-oriented framework (SOA) and service related assessments. The disputes are related to the quality of service (QoS) for choosing web services freely and creating a collection of web services for carrying out trades. The ultimate aim is to choose web services based on the non-functional features and quality of service (QoS) ranks. In order to choose a web service for every process a social aspect web (SAW) scheme is employed which does not comprehensively make use of all sorts of web services. It employs the requirements of the user for ranking web service set of the applications and finally provides SAW schemes over a set of web service applicants. The mechanism helps in selecting the web services in terms of quality of services (QoS) scores and user needs. The choice of web services over varied web services based on scheme can be utilised for aggregation and organising web services resulting in optimised time of reply to the web service actions.

Keywords: quality of service; QoS; social aspect web; SAW; ranks; web services; non-functional features.

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GENE POPULATED SPECTRAL CLUSTERING FOR ENERGY EFFICIENT MULTIPLE INTRUSION DETECTION AND RESPONSIVE MECHANISM FOR MANET

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A.V.Santhosh Babu, **Dr.P.Meenakshi Devi** · Published 2020

—A mobile ad hoc network (MANET) is a structure less network where the mobile devices are moved in random manner. In MANET, Each mobile device is randomly moves in various directions in the network. A few intrusions occurred due to the movement of mobile nodes in network. Mobile Nodes in an ad-hoc network are preserved by limited battery power for their operation. Hence, Energy management is a significant concern in a mobile ad-hoc network. In order to improve energy efficient multiple... CONTINUE READING

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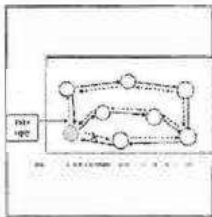


Figure 1

Table 1: Intran table

Node ID	packet sent (SN)	packet received (SN)	packet dropped	Time (sec)

Table 1

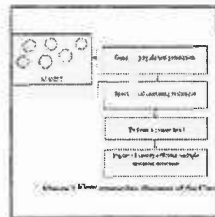


Figure 2

Table 2: Simulation Parameters

Parameter	Value
Scenario	MANET
Protocol	NS-2
Number of nodes	10
Area	1000x1000
Initial energy	1000 J
Initial speed	10 m/s
Simulation time	100 sec
Number of nodes	10
Number of links	10
Link capacity	10 Mbps
Link delay	10 ms
Link loss	0%
Link error	0%
Link jitter	0%
Link congestion	0%
Link bandwidth	10 Mbps
Link delay	10 ms
Link error	0%
Link jitter	0%
Link congestion	0%
Link bandwidth	10 Mbps

Table 2

Table 3: Simulation Results

Parameter	Value
Energy consumption	1000 J
Packet delivery ratio	100%
Packet loss ratio	0%
Packet delay	10 ms
Packet jitter	0%
Packet congestion	0%
Packet bandwidth	10 Mbps
Packet delay	10 ms
Packet error	0%
Packet jitter	0%
Packet congestion	0%
Packet bandwidth	10 Mbps

Table 3

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[International Journal of Information Systems and Change Management](#) > [2019 Vol.11 No.1](#)

Title: Performance analysis on cluster-based intrusion detection techniques for energy efficient and secured data communication in MANET

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Abstract: Mobile ad hoc network (MANET) is a network which includes the number of mobile nodes (MN) is joined without any access point (AP). In MANET, the numbers of mobile devices are deployed for communication within the transmission range. MANET has large number of vulnerabilities that degrades the network and makes communication as difficult one. Challenges in MANET include non-existence of reliability in-between nodes because of their mobility and topology variation. Lack of security in network makes the intruder to interrupt the data transmission that resulted in data loss. Most of the routing protocols perform efficient routing but the networks are more susceptible to various attacks. The conventional security method protects wired network however it is not effectual for detecting the variants of intrusive attack in MANET. Our main objective is to detect the variants of attacks in MANET with lesser EC and higher IDR. To improve the performance of routing, various intrusion detection techniques are discussed and examined using clustering process.

Keywords: mobile ad hoc network; MANET; access point; transmission range; security; mobility; topology variation; attacks.

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Design of a Hybrid Logic Based Adaboost Decision Tree Model for Identifying Web Attacks

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ABSTRACT

The foremost development in the volume and significance of web communication through the internet has enlarged the necessity of better security protection. The experts in providing security, while protecting the system maintains a record with containing marks of huge amount of support in recognizing attack revealing. Moreover, this limits the system capability as it can identify only the known attacks that are present in the database, in order to overcome this crisis, ensemble classifier to identify unknown attacks in the internet is proposed. This intrusion detection process involves elimination of redundant and irrelevant features using wrapper based and filter based approach. A hybrid Logic based Adaboost Decision tree model is employed here. The anticipated ensemble classifier was utilized in the online available NSL-KDD dataset which is an improved version of KDD cup dataset from 1999. The experimental outcomes demonstrates that the proposed method shows better trade off than the existing methods in terms of accuracy by 88.12 % in detecting the attacks than the traditional methods, while considering low false rejection rates. This proposed method is simulated in MATLAB environment to compute the accuracy.

Key. words: Anomaly detection, intrusion detection, Logit based Adaboost, classification, attacks, Decision Tree

1. INTRODUCTION

Wireless Sensor network is a network which is spatially allotted self-reliant sensors who co-operatively far its records to the sizeable area recognized so wretched rank [1-4]. In WSN, nodes fore its data together with wide variety of hops (multiple hops) according to its bad grade to decrease limit bad or after extend the batteries existence as like the control wished in accordance with dispose facts amongst twins nodes is without delay proportional in accordance with scale among the nodes [2]. As the WSN are deployed in far flung locations

where human can't reach yet if as soon as deployed, theirs batteries are sturdy in imitation of replace, accordingly it turns in accordance with be an extremely difficult undertaking after construct a battery powered community as execute stand scalable yet namely properly has lengthy existence span. Subsequent assignment over WSN is the wireless habit on communication. As the sensed facts propagate through wireless trough within the structure of radio frequencies, that turns in conformity with keep vital for network governor after protect network statistics out of intruders then attackers. Execution of various protection algorithms certain as like encryption, authentication, jamming detection alongside together with limit supply is a big element of WSN [21, 26].

WSN workshop in an surroundings where like is no consumer intervention and lesser consumer intervention then so is a node capturing risk, therefore it is essential because of sensor nodes in conformity with identify some assaults yet according to absorb corrective moves over its own in imitation of avert attackers beyond draining the complete lifespan about battery [5-9]. All legitimate node resources turns to busy state while replying to receiving data packets or authentication packets from attackers thereby making the battery to drain soon. Distributed denial of service is similar as that of DoS but more than one attacker is involved and cause severe attack. In this investigation, both the insider and the outsider attacks are handled using effectual feature selection and a hybrid classifier model to compute accuracy effectually [16-20].

The reminder of the work is structured as follows: Section II shows the state of the art of existing work that deals with handling the attacks and the related solutions to them [10]. Section III explains about the proposed work that includes selection of dataset (NSL-KDD dataset), followed by feature selection and the design of hybrid classifier to identify both the insider and the outsider attack. Section IV shows the numerical outcomes and discussion of the anticipated work. Section V illustrates the conclusion with the future direction of the work.

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Survey on Healthcare Hazard Control Responsibilities, Practice and Analysis

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ABSTRACT

Healthcare is one of the fastest growing sectors of the US economy, employing over 12 million workers with women representing about 80% of the healthcare workforce. Rates of occupational injury to healthcare workers have risen over the past decade. Safety issues facing by the organizations include back injuries, slips and falls, laser hazards, chemical exposures, biological hazards, workplace violence, and community safety issues. A cause of accident is a result of hazard. A careless or uncontrolled hazard results in a major accident or a minor hazard. Now-a-days; orientation, training, education has been done as a record for documentation. This kind of activity results in poor knowledge in job and hazard. The objective of this paper is to know about the responsibility of an individual based on leadership approach to be carried out in an organization, their work practice of effective management along with hazard control analysis and job hazard analysis (JHA), also called a job safety analysis (JSA), a technique to identify the dangers of specific tasks in order to reduce the risk of injury to workers. This promotes to know what the hazards are; reduce or eliminate them before anyone gets hurt. Also impacts on both overt and covert cultures of organization. This helps the organization to maintain revenues, minimize losses, serve communities and meet regularities and accreditation requirements.

Keywords: hazard, Safety, Job hazard, risk, healthcare.

A. INTRODUCTION

Hazard control effectiveness impacts both the overt and covert cultures of any healthcare organization.

The safety culture of healthcare organizations must be recognizable by those served. Healthcare organizations seeking to maintain revenues, minimize losses, serve their communities, and meet regulatory or accreditation requirements need effective safety functions. Healthcare is one of the fastest growing sectors of the US economy, employing over 12 million workers with women representing about 80% of the healthcare workforce. Rates of occupational injury to healthcare workers have risen over the past decade. Safety issues facing healthcare organizations include needle sticks, back injuries, slips and falls, laser hazards, chemical exposures, biological hazards, workplace violence, and community safety issues.

An increased emphasis on topics such as emergency management, indoor air quality, and patient safety indicates that safety will remain a key function in healthcare organizations.

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Survey on Healthcare Hazard Control Responsibilities, Practice and Analysis

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ABSTRACT

Healthcare is one of the fastest growing sectors of the US economy, employing over 12 million workers with women representing about 80% of the healthcare workforce. Rates of occupational injury to healthcare workers have risen over the past decade. Safety issues facing by the organizations include back injuries, slips and falls, laser hazards, chemical exposures, biological hazards, workplace violence, and community safety issues. A cause of accident is a result of hazard. A careless or uncontrolled hazard results in a major accident or a minor hazard. Now-a-days; orientation, training, education has been done as a record for documentation. This kind of activity results in poor knowledge in job and hazard. The objective of this paper is to know about the responsibility of an individual based on leadership approach to be carried out in an organization, their work practice of effective management along with hazard control analysis and job hazard analysis (JHA), also called a job safety analysis (JSA), a technique to identify the dangers of specific tasks in order to reduce the risk of injury to workers. This promotes to know what the hazards are; reduce or eliminate them before anyone gets hurt. Also impacts on both overt and covert cultures of organization. This helps the organization to maintain revenues, minimize losses, serve communities and meet regularities and accreditation requirements.

Keywords: hazard, Safety, Job hazard, risk, healthcare.

A. INTRODUCTION

Hazard control effectiveness impacts both the overt and covert cultures of any healthcare organization.

The safety culture of healthcare organizations must be recognizable by those served. Healthcare organizations seeking to maintain revenues, minimize losses, serve their communities, and meet regulatory or accreditation requirements need effective safety functions. Healthcare is one of the fastest growing sectors of the US economy, employing over 12 million workers with women representing about 80% of the healthcare workforce. Rates of occupational injury to healthcare workers have risen over the past decade. Safety issues facing healthcare organizations include needle sticks, back injuries, slips and falls, laser hazards, chemical exposures, biological hazards, workplace violence, and community safety issues.

An increased emphasis on topics such as emergency management, indoor air quality, and patient safety indicates that safety will remain a key function in healthcare organizations.

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Enhancing QoS in MAC layer for IoT enabled multihop mobile networks

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ABSTRACT

Mobile Adhoc Networks (MANET) within the internet of Things (IOT) framework is one of the most important wireless networks in which mobile nodes are interconnected and transmit packets in a distributed way to provide various IoT oriented services. The heterogeneity characteristic feature of IoT pose technical challenges on MAC layer such as the increasing network traffic load, heterogeneous Quality of Service (QoS) demands. To overcome these problems, a super frame structure is designed that helps to prioritize voice and data packets and that helps to improve the performance in MANET. Within each super frame, voice packets access the channel in contention free period (CFP) for its transmission and data packets content for channel access in a contention period (cp). so, the maximal QoS performance is achieved by adapting to the network traffic load variations and that supports for the heterogenous QoS demands. In addition to the large coverage area, multihop connection is enabled that helps to reduce the energy consumption of the nodes.

Keywords— Voice and Data Separation, Bit Matrix, Channel Access, Multihop Mobile Networks, QoS

1. INTRODUCTION

The Internet of Things is the network of physical devices, vehicles, home appliances, mechanical, digital machines, computing devices and other items embedded with electronics, software, sensors, actuators, and network connectivity which empower these objects to connect each other and its ability to transfer data over a network without requiring human-to-human or human to computer interaction. The IoT is one of the most promising network infrastructures towards the next generation wireless network evolution. Various IoT oriented intelligent applications such as environment monitoring, intelligent control for smart homing and industrial automation can be realized using IoT framework (Yang et al. 2016). To support the increasing number of nodes and user demands, an IoT enabled mobile ad hoc network emerges as a promising wireless network to provide seamless Internet access for end users. A MANET consists of a group of self organized nodes interconnected for communication in a peer to peer manner, without any centralized control. Each mobile node can function

as a sender, receiver or an intermediate node of the data in the network (Li J et al. 2013). Due to low cost and simplified implementation, MANETs are widely deployed for applications such as smart home networking, prompt response in post disaster areas and tactical networks for the purpose of command interactions. IoT Enabled MANET is one of the most important wireless networks, in which mobile nodes are interconnected and transmit packets in a distributed way to provide various IoT oriented services. To improve the performance for IoT enabled MANETs, proper medium access control is required to distributed coordinate communications and interactions among mobile nodes. The unique characteristics of IoT pose technical challenges on MAC such as the increasing network traffic load, heterogeneous Quality of Service demands and the increased interference level in a multi-hop environment with a continuous injection of nodes and longer communication distances (Kabara and Calle, 2012). Hence, MAC for an IoT enabled MANET is required to achieve consistently maximal performance by adapting to network traffic load variations, providing the heterogenous QoS guarantee, and eliminating the interference in a multi-hop environment.

Internet of Things is a new revolution of the Internet and it plays an important role in a modern world. It can access information that has been aggregated by other things and provides components for complex services. The goal of the Internet of Things is to enable things to be connected anytime, anyplace, with anything and anyone ideally using any network and any service. The Internet of Things is not a single technology, but it is a mixture of different hardware and software technology. The Internet of Things provides solutions based on the integration of information technology, which refers to hardware and software used to store, retrieve and process data which includes electronic systems used for communication between individuals or groups. It is possible that the level of diversity will be scaled to a number a manageable connectivity technology that address the needs of the IoT applications that are adopted by the market and supported by a strong technology alliance. The fundamental characteristics of the IoT are Interconnectivity, Things related services, heterogeneity, Dynamic changes, enormous scale, safety and connectivity.

A comparison of word2vec models for Identifying similar words using Deep Learning Approaches

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Abstract:

In text analysis, frequency-based techniques like Count Vectorizer, Term Frequency-Inverse document frequency are used for term weighting. These approaches are based on the frequency of the words in the document. They do not consider the semantics of the word for weighting. So, word embedding is used in this work to overcome the limitations of frequency-based approaches. Word embedding produces the vector representation based on the similarity between the words in the sentence. Deep Learning performs better than traditional machine learning algorithms because of its ability to perform automatic feature extraction from raw data and its scalability. There are two word2vec models namely continuous bag-of-words (CBOW) and Skip-gram model. Both these techniques are shallow neural networks which map words to the target variable which is also a word. They learn weights which act as word vector representations. From the experiments conducted on the Gutenberg book review dataset, it is found that skip gram model performs better than CBOW model.

Keywords: Continuous bag-of-words model, Deep learning, Term Frequency, Term Frequency-Inverse Document Frequency, Skip-gram model, Word Embedding, Word2vec model.

1. INTRODUCTION

Machine learning is a technique to study the information from collections of prior data. It can be categorized into three types such as supervised, unsupervised and reinforcement algorithms. Supervised learning algorithm takes as input data with some notation called label and then predicts the corresponding output based on prior statements. It is also known as classification. Some real-world examples for classification task are image recognition, speech recognition, medical diagnosis, financial services, learning associations etc. Unsupervised learning algorithm takes input as data without label and predicts the output. The similar data are combined as group which is called as cluster.

Deep learning is a subset of machine learning algorithms that gradually extracts higher level features using multiple layers from the raw input. A neural network has input layer, hidden layer and output layer, whereas a deep neural network has more than one hidden layer. Deep neural network is used in a number of applications including natural language problems. Generally Bag-of-words (BOW) is used for representing the unstructured text in natural language processing tasks. It creates vocabulary of all unique words occurring in all the documents in the training set. Frequency-based approaches like count vectorizer and TF-IDF are used in the literature to represent the weight of the words in the document term matrix. But these methods have two main limitations: It does not consider the meaning of words in the document. So, the representation of different words (words having the same meaning) is extremely different. Also, these approaches result in a large sparse vector which requires a huge computational time. So, the above issues can be overcome by using a dense distributed representation for each word. Word embedding is a learned representation for text where the words that have the similar meaning have the identical representation as in [1]. It performs encoding of each word into a large real-valued vector as in [2]. Continuous bag-of-words (CBOW) and Skip-gram models are the two different learning models using word2vec approach. CBOW model

Effect of calcination process on structural and optical properties of tungsten doped ZnO nanostructures

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Keywords

Tungsten doped ZnO nanostructures;
Calcination process; Rhodamine B dye;
photocatalyst.

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ABSTRACT

A systematic investigation on the structural, optical and photo catalytic properties of pure and tungsten (W) doped ZnO nanoparticles synthesized by sonochemical method followed by increased calcinations temperature is presented here. The X-ray diffraction (XRD) analysis of these samples showed the formation of phase pure nanoparticles with wurtzite ZnO structure. The Ultra violet (UV-Vis) optical studies showed a blue shift in the absorbance peak spectrum with increasing the doping concentration of Tungsten. The FESEM imaging analysis reveals the spherical like morphology with agglomeration and clearly depicts the calcination temperature plays an important role in morphological formation and variation in agglomeration of the prepared ZnO nanostructures. The Rhodamine B (RhB) decomposition rate of the synthesized pure ZnO and tungsten doped ZnO nanoparticles were studied under the UV region. In the UV region, synthesized pure ZnO and Tungsten doped ZnO decomposed RhB dye. However, the RhB decomposition rate obtained using pure ZnO was much lower than by doped ZnO.

1. Introduction

Interest in the research efforts on ZnO nanostructures is pushed by means of its quite a number applications in blue and ultraviolet (UV) light emitters regions, transparent conductors, solar cell windows, gas sensors, photovoltaic devices and surface acoustic wave devices [1-6]. Progress made in the area of ZnO primarily based nanomaterials and devices shows that ZnO has a top notch viable due to its wide and direct band gap of 3.37 eV and a large excitonic binding energy of 60 meV at room temperature. In the past several years, a number of strategies have been employed to put together ZnO nanostructures such as Sol-gel, sonochemical, micro emulsion, hydrothermal and chemical coprecipitation methods. In this above mentioned methods, sonochemical method is recognized as opted method to prepare doped ZnO nanostructures (metal and non-metals) [7-12].

In the case of ZnO nanostructures, the fundamental limitations are the excessive energy gap, agglomeration, and poor particle dispersability. Researchers have attempted to overcome these issues by altering the structure of ZnO nanostructures using dopants or some other inhibitors. In fact, surface modification by surfactants has proven beneficial for heading off aggregation, and doping is expected to decrease the energy gap and shift the required excitation wavelength from the UV range to the visible light spectrum [13-16]. Therefore, the doping of the structure of ZnO nanostructures the usage of appropriate dopants is predicted to improve their affectivity in the photo degradation of organic pollutants and additionally in antibacterial activities [17-24].

In this paper, we discuss about the synthesis of W doped ZnO nanostructures via sonochemical root and the impact of calcination temperature on the structural and optical properties of synthesized nanostructures. The optoelectronic and photodegradation properties of ZnO nanoparticles are touchy to dopant and calcination temperature. It is consequently vital that the relation among the size and operating conditions be surely understood so that the properties of the nanoparticles may additionally be tuned in accordance to the purposes for which they are synthesized.

2. Experimental Details

2.1 Materials and Methods

Analytical Reagent (AR) grade zinc acetate ($ZnC_4H_6O_4$ -99.99%), Sodium tungstate ($Na_2O_4W \cdot 2H_2O$ -99.99%), sodium hydroxide, double distilled water (DD) were used as precursor materials without further purification for the preparation of pure and tungsten doped ZnO nanostructures by sonication method.

The Zinc acetate and sodium tungstate were dissolved separately in DD water to obtain 0.5 mol/l solutions. Sodium tungstate solution in required stoichiometry was slowly added into vigorously stirred zinc acetate (100 ml of 0.5 m) solution. After 30 mins, sodium hydroxide solution was slowly added into the above solution and solution was turns to whitish black colour gel type solution. Then this solution was transferred to sonication chamber and sonicated for 30 mins with 40Hz power. The resultant product was dried at 100°C for 12 hours (h) and calcined at 400, 600 and 800°C for 3 h. The pure ZnO nanostructures were also prepared by the same procedure without the addition of sodium tungstate solution. The schematic



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Table (1)

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Optics & Laser Technology



Optics & Laser Technology
Volume 127, July 2020, 102498

Ultra sensitive molybdenum disulfide (MoS₂)/graphene based hybrid sensor for the detection of NO₂ and formaldehyde gases by fiber optic clad modified method

M. Suganya^a, M. D. Neelak

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Available online 14 July 2020

1 July 2020

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Highlights

- A facile hydrothermal method was used to synthesize MoS₂/graphene nanocomposites.
- The MoS₂/graphene sensor shows high sensitivity (100) towards NO₂ gas.
- This could be due to high active sites and concentration of oxygen vacancies.

Abstract

Here we design and fabricate the molybdenum disulfide (MoS₂)/graphene based hybrid sensor and evaluated the gas sensing performance of numerous kind of gases Ethanol, methanol, acetone, CO, NO₂ and formaldehyde using clad removed fiber optic method. The hybrid sensors were characterized by XRD, SEM, TEM, EDS, Raman and BET analysis. The interconversion of MoS₂ spherical nanoparticles with 2D graphene sheet onto large active surface area, which facilitates the more absorption properties of gas molecules with presence vacancies were light. The

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Acid Red 88 Dye Degradation By Green Synthesized CeO₂/RGO Nanohybrid Photocatalyst Under Solar Light

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A sustainable method of preparation and its utilization in harvesting renewable energy is a prime concern in environmental protection. We report here the preparation of a hybrid inorganic semiconductor with organic carbon base as a solar active photocatalyst. The prepared catalyst is used for the environmental remediation of degrading dye molecules in an aqueous medium. Reported CeO₂/RGO nanohybrid catalyst (NHC) synthesis includes green synthesis of rGO using *Carica papaya* leaf extract followed by nanoceria coating over the reduced graphene oxide (RGO). The prepared catalyst was characterized by SEM, XRD, EDX, FTIR, BET surface area and UV-DRS. Photocatalytic degradation study of the acid red 88 (AR 88) dye by NHC was carried out under both UV and direct solar lights. Reaction kinetics for the photocatalytic degradation was studied.

KEYWORDS

Carica papaya, CeO₂/RGO NHC, Photocatalyst, Fractional order, Acid red 88

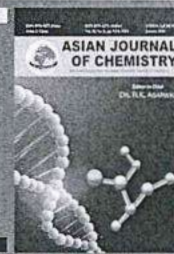
1. INTRODUCTION

The excessive exploitation and unsustainable consumption of natural resources create lots of imbalance in the ecological systems. Alongwith the overutilization, the ecological imbalance is also caused by the pollution on the air, land and water resources. Among the kinds of pollution, water pollution poses immediate and irredeemable damages to human health [1]. Thousands of water pollutants are declared as harmful for human health [2]. The large sized complex organic molecules like dyes are considered as a great hazard due to its non-biodegradable nature [3]. Industries, like dyeing, printing, plastic, paint and food industries use more than 10,000 types of dyes with an annual production of 0.7 million tonnes to impart colour to their products [4,5]. Large quantities of dyes are left unused and are released with the effluents [6]. In such a context, it is essential to remove the dye molecules present in the wastewater before releasing the effluent into the water bodies.

There are plenty of technologies in the form of physical, chemical and biological technologies are used for the removal of dye molecules present in the industrial

wastewater. But none of the reported technologies serves 100% solution in terms of efficiency and economic point of view [7]. Advanced oxidative degradation of organic dye molecules using semiconductor photocatalysts considered a promising one in terms of low operational cost and harmless byproducts, like CO₂ and H₂O [8]. However poor efficiency under solar light irradiation, difficult recovery of the catalyst after degradation process, photocorrosive effect and frequent agglomeration may limit the utility of these catalysts under large scale operations [1]. Under these circumstances, it is essential to develop new organic-inorganic hybrid materials to overcome the above said limitations. Recently many researchers are working towards the development of novel metal-organic structures with tailored band gap energy that is suitable for visible light harvesting [9].

A new class of multifunctional nanomaterials are synthesized by doping the nano-sized semiconductor materials onto the surface of reduced graphene oxide (RGO). These multifunctional nanomaterials have attracted many peoples owing to its enhanced catalytic, electrical and magnetic properties [10,11,12,13]. Recently nano-sized rare earth metal and its compounds doped on carbonaceous materials have also been demonstrated for photoluminescence, high temperature desulphurization and hydrogen production applications [14,15,16]. The rare earth oxide ceria is a promising



Green Synthesis and Applications of Nano CeO₂/rGO Solar Active Photocatalyst for the Degradation of Basic Auramine-O Dye

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In present study, the preparation of solar active photocatalyst and its application for the detoxification and degradation of dye molecules in aqueous medium is demonstrated. The reduced graphene oxide (rGO) is prepared from graphene oxide (GO) using *Carica papaya* leaf extract. Nanosize CeO₂ was coated over the rGO surface to make a nanocomposite photocatalyst. Prepared composite catalyst was characterized using SEM, HRTEM, XRD, EDX, FTIR, FT-Raman and UV-DRS techniques. The prepared composite catalyst was used for the degradation of auramine-O dye in its aqueous solution using UV and solar irradiations. The degradation kinetics is also evaluated using Langmuir-Hinshelwood kinetic model. The kinetic curves are analyzed using basic algorithm. A deviation from the experimental values and the reaction order is enumerated.

Keywords: CeO₂/rGO, *Carica papaya*, Photocatalytic degradation, Fractional order, Auramine-O dye.

INTRODUCTION

Over the decades, industrial sprawl and accumulation of population along river basins has created a huge amount of water pollution. Among the pollutants, dyeing industrial wastewater is a major concern, due to its toxicity, carcinogenic and deep coloring nature. The dye bearing wastewater creates huge environmental implications that directly affect the aquatic organisms and human beings [1,2]. Various physical, chemical and biological treatment technologies are reported for the removal of pollutants from the dye bearing wastewater. Some of them are adsorptive removal of dyes using high surface area adsorbents such as microporous [3] and activated spherical carbon spheres [4], chemical induced coagulation and flocculation by polymers [5], membrane separation like ultra- and nano-filtration [6,7] and advanced oxidation [8] technologies using atmospheric oxygen and biomes [9]. The applicability of the present technology is limited due to poor economic viability, poor selectivity towards dispersed dye, tedious optimization, longer adaptation period [10], massive sludge formation and

high energy input [11]. Using semiconductor photocatalysts, the detoxification and degradation can be achieved instantaneously with harmless end products.

TiO₂ [12], ZnO [13], ZnS [14], SnO₂ [15] and WO₃ [16] are some of the photocatalysts developed in recent times, extensively applied for photocatalytic dye degradation and organic compounds. Combined catalysts like SnO₂ co-doped with TiO₂ [17] and SnO₂ co-doped ZnO [18] are used as UV active photocatalysts for dye degradations. These semiconductor and chalcogenide catalysts have played eminent role in degrading the organic dyes with the help of UV light. Moreover, nano-architected carbon materials such as CNT along with semiconductor catalyst show a spectacular performance in photocatalysis. Recent investigations of CNT's superior electrochemical behaviour are promptly employed in super-capacitor electrodes as well as a hybrid material in energy storage appliances [19,20].

An allotropic, monolayered, one atom thick *sp*² hybridized carbon with a two-dimensional honeycomb matrix is known as graphene. Synthesis of graphene has opened up a spectrum of applications like lithium batteries [21,22], super-capacitors

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CORROSION BEHAVIOUR OF 18 CARAT GOLD IN RINGER SOLUTIONS IN THE PRESENCE OF SODIUM CHLORIDE AND GLUCOSE

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Keywords: 18 Carat gold; electrochemical studies; Ringer solutions; corrosion;

This work aims at studying the electrochemical behaviour of metals like 18 carat gold in presence of Simulated Ringer's Solution and Lactated Ringer's Solution in presence of 100 ppm of NaCl and also 100 ppm of glucose are used to simulate the body fluids. The behaviour of the metal was monitored by polarization study and electrochemical impedance spectroscopy (EIS). All the experiments were carried out at a constant temperature of 37 °C. From these studies, it was concluded that the avoid of excess of NaCl and also glucose in both Ringer solutions in medicinal uses.

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INTRODUCTION

Surface properties and anti-corrosion characteristics are the most important material characteristics determining the biofunctionality of all implant materials. 18 Carat gold has been a valuable biomaterial for manufacturing implants due to its unique properties such as shape memory effect, super elasticity and good mechanical properties.¹⁻⁴ Many devices such as stent, orthodontic wires and root canal files have been used clinically.²⁻⁵

Ringer's analysis of the influence of blood constituents on contraction of the frog heart (1882-1885) pioneered general development of artificial extracellular media for maintenance of living material during in vitro physiological studies. "Ringer's solutions" are thus defined here as those designed to substitute for the blood plasma, hemolymph, or other extracellular fluids of any species with respect to variables such as ionic concentrations, pH, and osmotic pressure. Media described in the literature as "physiological salines" and "balanced salt solutions" are included here under the general Ringer's heading. Mimicry of native conditions is achieved in varying degrees by the many different Ringer's formulations. Ringer's solutions are typically intended for relatively short-term maintenance of living material, not for its growth or extended culture. In this respect they differ from cell, tissue, and organ culture media, which are more complex and beyond the scope of this Compendium.

Since Na⁺ is normally the principal extracellular ion, sodium chloride is the major component of most Ringer's solutions. Some formulations have relatively few additional

ingredients but are nevertheless more complex than most "buffered salines", consisting principally of sodium chloride and a pH buffer, presented ions such as Na⁺, K⁺, Ca²⁺, and Mg²⁺ are critical for many functions. Researchers initiating work are urged to select physiological solutions carefully for the particular species to be studied, and to consider developing new ones based on analysis of the natural extracellular medium. Many Ringer's solutions,⁶⁻⁸ are the product of empirical testing for retention of the activity being studied. Thus, in addition to being used directly, recipes provided here can serve as a starting point for improved formulations.

The Electrochemical impedance spectroscopy (EIS) is a relatively modern technique widely extended in several scientific fields. The EIS consists on a non-destructive technique when working under equilibrium conditions (free corrosion potential or open circuit potential), particularly sensible to small changes in the system that allows to characterize material properties and electrochemical systems even in low conductive media.

The impedance method consists in measuring the response of an electrode to a sinusoidal potential modulation of small amplitude (typically 5-10 mV) at different frequencies. The alternative current (AC) modulation is superimposed either onto an applied anodic potential or cathodic potential or onto the corrosion potential.^{9,10}

EXPERIMENTAL

Materials and methods

Corrosion resistance of 18 Carat Gold in Ringer's Solution and lactated Ringer solution has been investigated by polarization study and AC impedance measurements. All measurements were performed at 37±1 °C. Ringer's Solution was composed of 6.0 g L⁻¹ NaCl, 0.075 g L⁻¹ KCl, 0.1 g L⁻¹ CaCl₂ and 0.1 g L⁻¹ NaHCO₃. The lactated Ringer solution comprised of 6.0 g L⁻¹ NaCl, 0.3 g L⁻¹ KCl, 0.2 g L⁻¹ CaCl₂ and 3.1 g L⁻¹ sodium lactate.^{6-8,11}