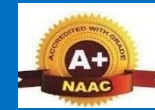**3.3.2   Number of research papers per teachers in the Journals notified on UGC website during the year 2022**

Year	No of Publications
2022	34

3.3.2 Number of research papers per teachers in the Journals notified on UGC website during the year 2022

Title of Paper	Name of the Author/s	Department of the Faculty	Name of Journal	Year of Publication	ISSN Number	Page No
LSTM Based Spectrum Prediction for Real Time Spectrum Access for IOT Applications	Dr.R.Nandakumar	ECE	Intelligent automation & soft computing	2022	ISSN (Online): 2326-005X	8
Detection of Diabetic Retinopathy from Retinal Images using DenseNet Models	Dr.R.Nandakumar	ECE	Computer System Science &Engineering	2022	ISSN 0267-6192	9
Environmental Impact of High Voltage Insulator Quality Analysis using Improved Deep Learning approach	Mr.P.Govindaraju	ECE	Journal of Environmental Protection and Ecology	2022	ISSN 1311-5065	10-11
Collaborative autonomous system based wireless security in signalprocessing using deep learning techniques	Dr.L.Selvam	IT	International Journal for Light and Electron Optics	2022	2348-7550	12-13

Title	Author	Dept	Journal	Year	ISSN	Page
Energy Efficient Server with Dynamic Load Balancing Mechanism for Cloud Computing Environment	Dr.M.Venkatesan	CSE	Wireless Personal Communications	2022	0929-6212,1572834X	14-15
The hydrological impact of tropical cyclones on soil moisture using a sensor based hybrid deep learning model	Dr. M. Vimaladevi	CSE	Acta Geophysica – Springer	2022	1895- 6572.	16
An Extended boost diodeclamped impedance source inverter for electrical vehicle power train motor drive	C. Santha Kumar	EEE	Materials today Proceedings, Elsevier	2022	2214-7853	17
Investigation of battery management system for electric vehicles wireless power charger	C. Santha Kumar	EEE	Materials today Proceedings, Elsevier	2022	2214-7853	18
Sensor-less field orientation control for brushless direct current motor controller for electric vehicles	C. Santha Kumar	EEE	Materials today Proceedings, Elsevier	2022	2214-7853	19
Minimum device usages of field programmable gate array (FPGA) verification of multilevel PWM inverter drive generation	C. Santha Kumar	EEE	Materials today Proceedings, Elsevier	2022	2214-7853	20
Extended over modulation zone three-dimensional SVPWM for three-level neutral-point-clamped	C. Santha Kumar	EEE	Materials today Proceedings, Elsevier	2022	2214-7853	21
Performance Analysis of Five-Phase NPC MLI with Phase Shifting Carrier Pulse Width Modulation	C. Santha Kumar	EEE	ECS Transactions	2022	Online ISSN: 1938-6737 Print ISSN: 1938-5862	22

Design of Mono Stage Luo Converter for Electric Vehicles Charging System	C. Santha Kumar	EEE	ECS Transactions	2022	Online ISSN: 1938-6737 Print ISSN: 1938-5862	23
Experimental investigations on mechanical and water absorption properties of epoxy resin-banana fiber-tamarind seed particles hybrid biocomposites	Dr.P.Gopinath	Mechanical	Materials Today: Proceedings	2022	2214-7853	24
An Image Denoising Scheme Remove Unwanted Pixel Using NLM With Sprint Deep Learning Network	Dr.L.Selvam	IT	International Journalof Intelligent Systems and Applications	2022	0030-4026	25-26
An efficient and secure data sharing scheme for cloud datausing hash based quadraplet wavelet permuted cryptography approach,	Dr.L.Selvam	IT	Concurrency and Computation: Practice and Experience	2022	2147-6799	27-28
Lung disease detection using Self-Attention Generative Adversarial Capsule network optimized with sun flower Optimization Algorithm	Dr.N.B.Maheshkumar	IT	Biomedical Signal Processing and Control	2022	1532-0634	29
Monodisperse ceria nanoparticles synthesized one phase system by hydro-solvothermal method: Evaluation of its anticorrosive properties	Dr.V. Devabharathi	PHYSICS	AIP Conference Proceedings	2022	1551-7616	30-31
Automatic Accident Prevention System for Heavy Passenger Vehicles	P. Chakravarthi	Mechanical	Gradiva Review Journal	2022	0363-8057	32

Title	Author	Department	Journal	Year	ISSN	No.
Analysis of Nozzle Spray Volumetric Distribution of Broadcasting and Banding Application Using SPSS Software	Dr.P. kanakarajan Dr.M.Sivakumar	Mechanical	Gradiva Review Journal	2022	0363-8058	33
Magnetic nano carbon balls - Synthesis and adsorption studies	B.Murugesan	Chemistry	Indian Journal of Chemical Technology	2022	0974-7443	34
Mechanical Properties Evaluation of Tib2 & Nb Reinforced Aluminium 7075 For Pump Impeller Applications	A.Mohanraj	Mechanical	International Journal for Science and Advance Research in Technology	2022	2395-1052	35
Double Security System For Unlocking Automobile Ignition	A.Premkumar	Mechanical	International Journal for Science and Advance Research in Technology	2022	2395-1053	36
Adaptive Control based Condition Monitoring of CNC Machine	S. Balamurugan, R.Vasanthakumar	Mechanical	International Journal for Research in Applied Science & Engineering Technology	2022	2321-9653	37
Automatic Detection of Temperature And Mask Scan Entry System For COVID Prevention	Dr.P.Kanakarajan	Mechanical	International Journal for Science and Advance Research in Technology	2022	2395-1052	38
Modelling and analysis of 2D double U auxetic honeycomb structure in radiators for increasing heat transfer	R.Vasanthakumar	Mechanical	International Journal of Research Publication and	2022	2582-7421	39

			Reviews			
Design and Optimization of Automatic Air Blow in Vmc for Burr Removals	K.Velusamy	Mechanical	International Journal for Science and Advance Research in Technology	2022	ISSN 2395-1052	40
EV Communication System using IoT Mechanism	Dr. R.Jeyabharath	EEE	International Journal of Electrical and Electronics Engineers	2022	ISSN 2321-2055 (Online), ISSN 2321-2015	41
Cracked Egg Detection For Poultry Industry Using IoT	Dr P.Veena	EEE	International Journal of Electrical and Electronics Engineers	2022	ISSN 2321-2055 (Online), 2321-2015	42
Controlling of surgical robotics platform for Endoscopic using fuzzy logic controller	Ragu P J, Swathi Sri R	BME	International Research Journal of Modernization in engineering Technology and Science	2022	2582-5208	43
Flood Monitoring and Alerting System Using IoT	Dr.S.Premalatha	ECE	International journal of intellectual advancements and research in engineering computations	2022	ISSN 2348-2079	44

IOT based Coal mine workers safety monitoring and alerting system	Dr.S.Jayachitra	ECE	International journal of intellectual advancements and research in engineering computations	2022	ISSN 2348-2079	45
Cold Supply Chain Risk Monitoring and Safety alerting System Using IoT	Mr.M.Udhayakumar	ECE	International journal of intellectual advancements and research in engineering computations	2022	ISSN 2348-2079	46
Smart Drainage Monitoring and Controlling System using IoT and Machine Learning	Dr.P.Meenakshi Devi	IT	International Journal of Advanced technology in Engineering and Science	2022	ISSN 2348-7550	47

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LSTM Based Spectrum Prediction for Real-Time Spectrum Access for IoT Applications

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Abstract: In the Internet of Things (IoT) scenario, many devices will communicate in the presence of the cellular network; the chances of availability of spectrum will be very scary given the presence of large numbers of mobile users and large amounts of applications. Spectrum prediction is very encouraging for high traffic next-generation wireless networks, where devices/machines which are part of the Cognitive Radio Network (CRN) can predict the spectrum state prior to transmission to save their limited energy by avoiding unnecessarily sensing radio spectrum. Long short-term memory (LSTM) is employed to simultaneously predict the Radio Spectrum State (RSS) for two-time slots, thereby allowing the secondary node to use the prediction result to transmit its information to achieve lower waiting time hence, enhanced performance capacity. A framework of spectral transmission based on the LSTM prediction is formulated, named as positive prediction and sensing-based spectrum access. The proposed scheme provides an average maximum waiting time gain of 2.88 ms. The proposed scheme provides 0.096 bps more capacity than a conventional energy detector.

Keywords: Cognitive radio network; encoder-decoder LSTM; waiting time; capacity

1 Introduction

Demand for spectrum is expected to increase drastically in the next-generation wireless network, which is expected to support extremely high data rates and more numbers of connected devices. Conventional static spectrum allocation policies can no longer provide substantial improvement due to the inefficient use of the wireless spectrum [1]. Federal Communication Commission (FCC) reported [2] that majority of the spectrum allocated to licensed users remains underutilized at any given time and location. To solve the contradiction between spectrum scarcity and spectrum under-utilization cognitive radio network (CRN), which allows unlicensed user/secondary users to opportunistically access the spectrum in such a way that it does not cause any harmful interference to the licensed user/primary user [3,4] evolved. The first step towards realizing Cognitive Radio (CR) requires the Secondary User (SU) to sense the radio spectrum state (RSS), which consumes a considerable amount of time and energy. This can be eliminated with the

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Detection of Diabetic Retinopathy from Retinal Images Using DenseNet Models

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Abstract: A prevalent diabetic complication is Diabetic Retinopathy (DR), which can damage the retina's veins, leading to a severe loss of vision. If treated in the early stage, it can help to prevent vision loss. But since its diagnosis takes time and there is a shortage of ophthalmologists, patients suffer vision loss even before diagnosis. Hence, early detection of DR is the necessity of the time. The primary purpose of the work is to apply the data fusion/feature fusion technique, which combines more than one relevant feature to predict diabetic retinopathy at an early stage with greater accuracy. Mechanized procedures for diabetic retinopathy analysis are fundamental in taking care of these issues. While profound learning for parallel characterization has accomplished high approval exactness's, multi-stage order results are less noteworthy, especially during beginning phase sickness. Densely Connected Convolutional Networks are suggested to detect of Diabetic Retinopathy on retinal images. The presented model is trained on a Diabetic Retinopathy Dataset having 3,662 images given by APTOS. Experimental results suggest that the training accuracy of 93.51% 0.98 precision, 0.98 recall and 0.98 F1-score has been achieved through the best one out of the three models in the proposed work. The same model is tested on 550 images of the Kaggle 2015 dataset where the proposed model was able to detect No DR images with 96% accuracy, Mild DR images with 90% accuracy, Moderate DR images with 89% accuracy, Severe DR images with 87% accuracy and Proliferative DR images with 93% accuracy.

Keywords: Convolutional Neural Networks; vision loss; pathogenic blood vessels; DenseNet; AlexNet; ResNet

1 Introduction

One of the most prevalent diseases around the world is Diabetic Mellitus. The extended prevalence of diabetes causes several problems related to health, such as Diabetic Retinopathy, nephropathy, diabetic foot, etc. The most common issue is Diabetic Retinopathy (DR). Diabetic Retinopathy is a diabetes complication that can harm the retina's veins and leads to significant vision loss. Diabetic Retinopathy typically happens when high glucose levels damage the veins and limit the bloodstream to the retina. Initially, it starts with no

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ENVIRONMENTAL IMPACT OF HIGH VOLTAGE INSULATOR QUALITY ANALYSIS USING IMPROVED DEEP LEARNING APPROACH

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Abstract. Insulators are used in electricity transmission lines to protect the transmission line from damage caused by arching and other natural disturbances such as cyclones, floods, and rain. These insulators are installed on the outside of transmission lines, which are readily contaminated by external elements such as dust, sand, salt particles, and other contaminants. As a result of this build up, current leakage occurs, resulting in a fault system. In existing, the insulator behaviour analysed based on partial discharge assessment using wireless sensor network and convolutional neural network. It provides a minimum false acceptance rate but the feature map selection is based on grid search, which does not provide better performance in future. To overcome this, a forest optimisation is proposed in this paper to select the feature map and hidden neuron size in convolutional networks for partial discharge detection in High voltage insulators with Wireless sensor network-based monitoring units. The WSN is utilised for monitoring the environmental conditions around the insulator. Then, the proposed method achieved minimum miss and false acceptance rate as compared to the existing Convolutional neural network and other machine learning approaches.

Keywords: high voltage, insulators, WSN, monitoring, optimisation, CNN, partial discharge.

AIMS AND BACKGROUND

In power transmission lines, the insulators are used to protect the transmission line from damage due to arching and other natural disturbances like cyclone, flood, rain. The insulators also prevent passing the current from the transmission line to the earth through poles. The proposed approach in this paper also used sensor networks to monitor environmental conditions in high voltage insulators. The partial discharge is detected here by monitoring the insulator's surrounding environmental conditions. Depending on the voltage, there are different types of insulators as mentioned in Fig. 1.
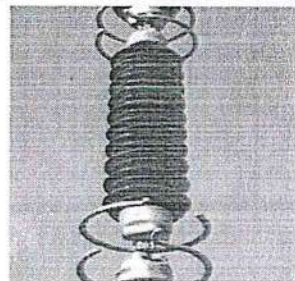
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* For correspondence.

Insulator type	Image	Purpose
Pin-type		Upto 11,000 V by single pin Max 33,000 V by more insulators
Line post		Medium voltage in the cities
Suspension		<11,000 V
Strain insulator	 STRAIN INSULATOR	Similar to suspension arrange in horizontal manner
Shackle or spool insulator		Low voltage applications

Fig. 1. Types of insulators

An artificial pollution is induced on the solid layer insulator and its leakage current is noted. Then, the autocorrelation is used for finding the optimal feature set and the rough set theory is used for the prediction of contamination level on the insulator[1].

A comparison of traditional and microwave based analysis for contamination level prediction on insulators is studied[2]. Here, they stated that the traditional parameters like leakage current and partial discharge are suitable for the dry area. While for wet regions, the microwave based reflectometry analysis is best based on their result comparison.

A combination of imaging and partial discharge (PD) analysis is used for measuring the contamination level on the insulators[3]. Here, the wavelet transform is used for the PD measurement and thermal imaging is used for measuring the

Collaborative autonomous system based wireless security in signal processing using deep learning techniques

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ABSTRACT

Intelligent signal processing offers a variety of methods for communication system design and operation, including fuzzy logic, neural networks and evolutionary computation. This study proposes a novel technique for designing a mobile sensor network algorithm based on wireless security to provide a secure as well as energy-efficient communication system that allows sensor swarms to move while maintaining optimal sensor node spacing. Here signal feature extraction has been done using cuckoo Meta search algorithm (Cu_MeSA) and classification using Fuzzy based Boltzmann convolution machine neural network with (Fuz_Bol_ConVMNN) architecture. The experimental results shows that the output signal of feature extraction and classification with comparative parametric analysis in terms of packet arrival rate, network lifespan, energy optimization, probability of attack detection, throughput.

1. Introduction

Next-generation network communication methods will deliver multimedia services over diverse mobile networks and facilitate seamless mobility in a more flexible way than previous generations. Integration of several access networks, such as cellular networks, satellite networks and wireless local area network (LAN), in a hierarchical layered form [1] is a classic scenario of heterogeneous networks method design [2]. Given that consumers anticipate the most efficient access network to provide the demand service [3] between the cellular network, satellite network and wireless LAN. A multimode terminal (MMT) that can operate in all access segments is required. Mobility management is one of the most essential and difficult problems in wireless communication as well as computing, with mobile IP protocol as well as wireless radio resource management being most common hot topics. Access network selection as well as handover organization is critical in the wireless radio resource management [4]. Memetic computing is the state-of-the-art enacted domain of computational intelligence heading towards the development and implementation of diverse new techniques for complex problem-solving. Multi-criteria decision-making (MCDM) techniques are being developed to address heterogeneity

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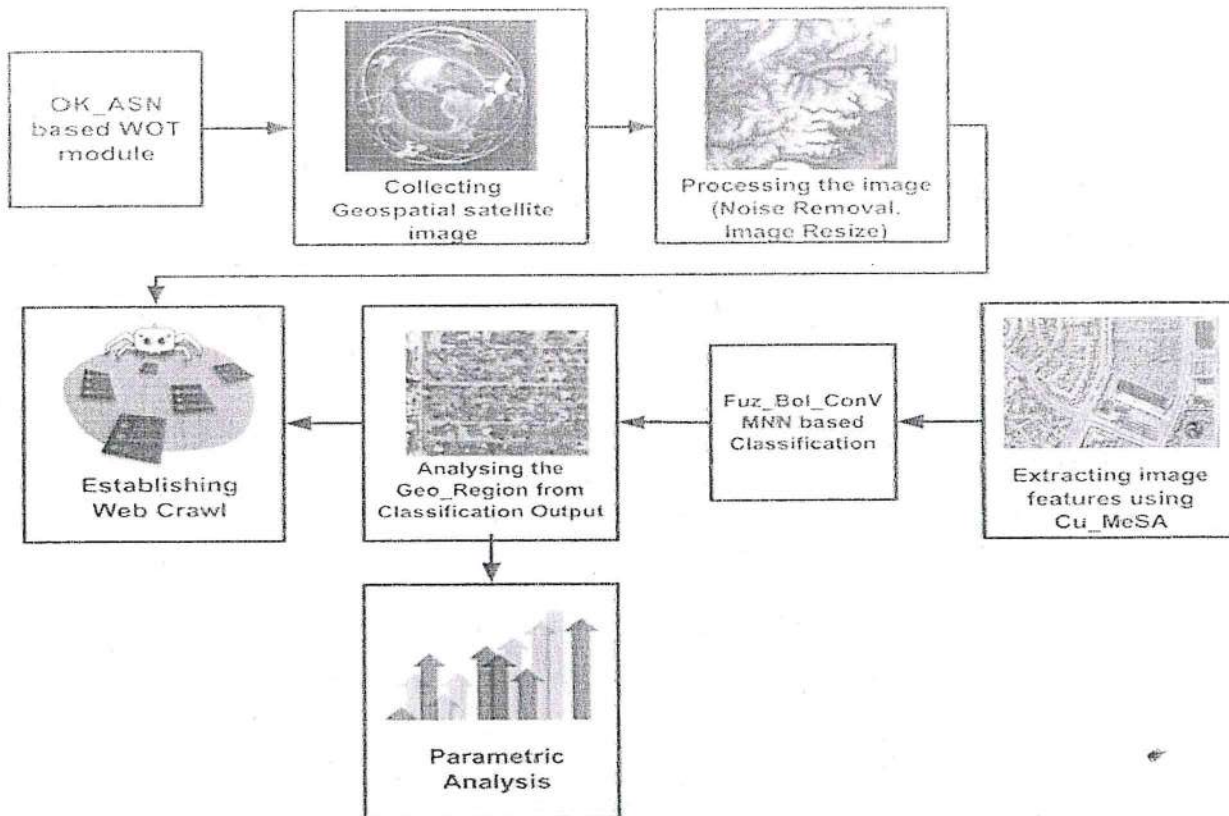 E-mail address: sqamar@kku.edu.sa (S. Qamar).

Fig. 1. Overall Proposed Architecture.

requirements [5]. Fuzzy logic as well as neural network (NN) [6] classifiers are attractive choices for MCDM algorithms because of their non-linearity and generalisation ability [7].

Rest of this paper is organized as follows. Section II presents existing techniques. Detail of proposed model is explained in section III. Section IV gives experimental results. Finally, Section V concludes paper.

Contribution of this research is as follows:

- The signal has been extracted and classified using metaheuristics based optimization algorithm and deep learning techniques based on wireless security.
- Here the features of signal have been extracted using cuckoo meta search algorithm (Cu_MeSA) and classification using Fuzzy based Boltzmann convolution machine neural network with (Fuz_Bol_ConVMNN) architecture
- The experimental results show comparative analysis in terms of packet arrival rate, network lifespan, energy optimization, probability of attack detection, throughput.

2. Related works

The development of an effective VHO (Very High Output) method for providing seamless service in heterogeneous wireless networks is difficult for solving VHO problems. An adaptive fuzzy-based VHO method was reported in [8] in which the Relative Signal Strength's (RSS) handoff hysteresis value was selected by user speed as well as traffic load using a fuzzy logic system. The VHO choice process was improved in [9] by combining service type with RSS. Fuzzy logic method was employed to confirm cell selection at same time. However, RSS threshold for VHO determination is set, ping-pong effect cannot be avoided. Theoretical descriptions for mobility management in heterogeneous networks were only presented in [10] which provide multi-criteria decision-making technique based on fuzzy theory for access network selection. In Ref. [11], neuro-fuzzy predictor was utilised to forecast RSS in cellular networks as well as WLAN (Wireless Local Area Network). It proposed a fuzzy inference method based on fuzzy predictor to determine possibility of handoff using the fuzzy decision method. However, system's complexity must be resolved before it can be extensively used. A fuzzy logic VHO strategy was investigated in Ref. [12] which used differential prediction as well as pre-decision procedure to activate a VHO trigger.

In a lognormal fading setting, GPT (GUID Partition Table) is utilised to predict future RSS indicator values [13]. Reference [14] used a grey prediction technique for RSS in horizontal handoff procedures using a method based on relative signal intensity with

Energy Efficient Server with Dynamic Load Balancing Mechanism for Cloud Computing Environment

T. K. P. Rajagopal[1] · M. Venkatesan[2]

Abstract

Currently the rapid development of technology is taking place in the field of cloud computing. Cloud computing environment is the very demanding. It is easily accessible to provide the computer network service and resources using the Internet. It offers a variety of services such as Software as a Service (SAAS), Platform as a Service (PAAS) and Infrastructure as a Service (IAAS). The development of cloud computing environment primarily refers to the cloud service users and the cloud service provider. Cloud service user can utilize all kind of services provided by the provider and Cloud service provider provide cloud resources to the user. The service provider should use its resources professionally to make earnings, but in cloud environment, the difficult task for them is to improve the cloud resources. This article express the network energy reduction approach through optimizing the load using the network node and reducing the active network node by rearranging techniques.

Keywords Dynamic load balancing · Computer networks · Distributed system · Cloud computing environment

1 Introduction to Cloud Computing Environment

Cloud environment is a type of computer environment that will share the various computer resources like memory instead of using a local computer server or personal computer server to handle the various cloud applications [1]. Atpresent are many problems in the cloud environment such as cloud security, cloud privacy, cloud compliance, cloud stability and cloud load balance. The proper load balancing is the primary and biggest problem in cloud computing environment. The most important question is the distribution of the

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load on the cloud environment resources shared on the computer networks and Internet. In this junction two or more load servers are used to complete an assigned task, in another the load balancing algorithm is needed to determine and to check whether or not, cloud computing environment server is used to allocate a particular task and which cloud computing environment server is overloaded. In some of the cloud computing environment, systems have to deal with the condition of the cloud computing, servers are scattered over the different locations [1, 2]. This article deals with different possible cloud computing environment approaches to dynamic load balancing algorithm in various cloud computing environments.

In the first method we discuss about the nature-inspired approach for effectively balancing loads on distributed servers.

The second method took random samples of the computer domain and designed them so that all nodes were self-organizing.

The third method equates the node cluster with similar behaviors and the load balance within the group.

The forth method compares the current network node load balancing with the others and balances the load according to the cloud environment current system load balancing.

The last method calculates the load balancing of the network node variable and load balances based on the loads.

2 Cloud computing environment

Cloud computing environment is primarily distributed and developed to implement computing within different types of resources. Cloud computing has no specific definition, but it is defined as a set of distributed computers that can provide the required calculation resources of the cloud environment and load balancing services with the assist of the Internet services [1, 3, 4]. As discussed, the cloud environment provides various services like SAAS, PAAS and IAAS to various location of the diverse clientele. A distinguished example is the Amazon Elastic Compute Cloud (Amazon EC2) system, which provides the VM environment, various configurations of the system CPU, processor and memory of the computer systems.

3 Existing Technology

In the previous technology, subdivisions of the various types of the cloud computing environment, load balancing tools are clearly explained and defined in various technologies and their performances.

3.1 Honey Bees Technique

The honey bee's technique is self-regulatory and behavioral based algorithm, used for dynamic load balancing in application layer of the networks [5]. This Honey bee technique algorithm was inspired by Honey bees' approach for finding their foods. Two attributes are defined here, one of the methods is forerunner and the other is inspected. In the first method scout bees searches for a suitable food source and when they find a specific food source they come back and perform "Waggle dance".

The hydrological impact of tropical cyclones on soil moisture using a sensor based hybrid deep learning model

Gautam Srivastava[1,4,5] · V. Kavitha[2] · M. Vimaladevi[3] · N. Parthiban[2]

Abstract

Tropical cyclones that originate from the Indian Ocean affect the Indian Sub-Continent. Heavy rainfall and flooding occur because of these cyclones. South Odisha was affected by Cyclonic Storm Daye in September 2018 and Cyclonic Storm Titli was occurred in August affecting Andhra Pradesh and Odisha as well. The Eastern portion of India was affected by the Cyclonic Storm Fani in April 2019. In May 2020, West Bengal was affected by the Amphan which is a Super Cyclonic Storm and in the same year Tamil Nadu was affected by the very severe Cyclonic Storm Nivar in November 2020. These are just a few of the notable cyclonic events in the Indian Sub-Continent. These cyclonic events cause a dramatic change in a very short time from dry soil to exceptional flooding. In this proposed work, we are attempting to create an observations-driven prediction model to quantify the soil moisture variations daily, predict county-based meteorology and evaluate the cause of cyclones and heavy rainfall in certain areas of India. In our work, we applied a deep learning-based methodology to predict soil moisture. For the prediction model, we fused Feed Forward Neural Networks with the Gated Recurrent Unit (GRU) model and present the prediction results. We have used climatic as well as environmental data published by the Indian Meteorological Department (IMD) Warning from 2011. The collected data is time-series data. Comparisons and the relationship that exists between soil moisture and meteorological data are made and analyzed. The soil moisture of the South Indian states Karnataka, Andhra Pradesh and Tamil Nadu are predicted from weather data using a hybrid deep learning model. The evaluations of the proposed work using Mean Absolute Error (MAE), Mean Squared Error (MSE), Root Mean Squared Error (RMSE) and R-squared (R^2) against Non-hybrid Neural Network models such as Artificial Neural Networks (ANN), Convolutional Neural Networks, and Gated Recurrent Unit (GRU) models is analyzes where our model has given better results.

Keywords Soil moisture prediction · Sensor technology · Deep learning · GRU · FFNN · Tropical cyclones

Introduction

It is anticipated that the population of the world will reach seven to ten billion in the coming years. This enormous growth of population may lead to freshwater scarcity and

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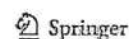 vimal.vcet@gmail.com

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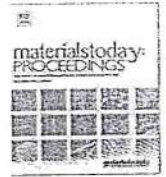
An extended boost diode-clamped impedance source inverter for electrical vehicle powertrain motor drive

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ARTICLE INFO

ABSTRACT

Improving Electric Vehicle motor drive fast charging and discharging analysis use extended boost Diode-Clamped Z- source Impedance Inverter. A single–stage power conversion by using unique impedance (Z) network with inverter circuit to boost AC output voltage through shoot-through (ST) and non-ST. In this case, Z networks are directly responsible for balancing the inductive voltage boosting and output levels. The ST states limit the modulation index and cause huge ST current in the inverter phase legs.

The conventional Pulse Width Modulation (PWM) methods for Z-source Neutral Point Clamped (NPC)-Multi Level Inverter (MLI) use the full ST (turned ON all the inverter switches in a leg), which occupies more switching commutations per switching cycle and leads to unequal inductor charging and discharging, resulting in more harmonics in the output voltage and current waveforms. It is noted from earlier developmental drifts that by using a single Z-network, performance dreadful conditions are usually expected. Creating the full ST misguides to extra switching commutations as well as unequal charging and discharging of inductor. The proposed Z-source MLI (Space Vector Modulation) SVM technique offers a Top and Bottom ST for charging the Z-network inductors with balance the inverter DC-link capacitor. The simple mathematical function used based on two-level SVM Z-source MLI SVM proposed and has more flexibility to choosing the switching patterns without complex function; thereby it offered real time implementation in simpler manner. The also paper contributes a comprehensive study on development procedure of proposed Z-source MLI SVM FPGA environment validation. The proposed SVM is implemented with three-level Z source neutral point MLI through MATLAB simulation and 1-kW experiment prototype is built to verify the theoretical analysis.

1. Introduction

The recent development in Z-Source inverters (ZSI) which overcomes the few performance parameters includes inverters voltage gain improvements without including the transformer or high output voltage converters, conventional voltage source inverter (VSI), High gain DC-DC converters, and transformer-based converters are required. A Z source network suitable of both less and high output voltage with respect to input voltage[1]. Since the Z source network topology combination of passive components (L and C), the different output voltage with constant DC source operation can be controlled by power semiconductor switches respect to changing the PWM strategy instead of using a separate PWM method.

A shoot through stage is used in the Z- source inverter systems to obtain the maximum AC output voltage. In the shoot through stage, two switches in one leg are turned together at the same moment to insert a zero–voltage state. In this state, the inductors in the Z-source network are energized and the capacitors are discharged. Different type of ZSI and for the different types of MLIs proposed so far [2–5].

The disadvantages of ZSIs include discontinuous input current induced by the input diode through input source supply and the dc connection, as well as the failure to share a common ground

Investigation of battery management system for electric vehicles wireless power charger

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ABSTRACT

Monitoring of battery pack and cells plays important role in the development of Electric Vehicles (EVs) because the functioning and performance of the EV and the passenger safety is directly related to battery performance and health. Recent developments in the Wireless power Technology (WPT) have opened new perspectives for different charging infrastructures for electric mobility systems. The Battery Management System (BMS) play a pivotal role in making the operation of charging infrastructures sustainable. To implement an environment for the BMS, it is needed to monitor the charging patterns and battery life of the battery which can adapt to WPT techniques for implementing fast charging, reducing range anxiety, and providing exceptional performance with energy optimization. Compared to plug-in charging wireless charging BMS should work robustly due to uneven small charging intervals. This article focuses discussing effect of static and dynamic wireless charging on the BMS implementation.

1. Introduction

Nowadays utilization of vehicles increasing day by day, causing an increase in the pollution levels in the environment. Rising concerns over global warming people are shifting toward electric vehicles. The combination of Electric vehicles and renewable energy sources is the best option non-polluted transport system. However, there is a major hindrance in the future development of the EV market: range anxiety. This problem arises due to the limited capacity of the battery and long charging times. Consequently, the ways to ease range anxiety are by enhancing battery capacity or developing the charging method. However, the increase in the battery size increases the cost and the vehicle volume (using advanced battery technology), for travelling each distance (in km) also increases the energy consumption. Another method is reducing battery charging time. Hence, this model can be developing the solution more capable and desirable at the present stage [1,2].

EV charging could be performed in two ways one is wired (plug-in) or another way is wireless charging. Wired charging is widely used charging method in present, also called as conductive charging or plug-in charging, in this power transfer between the supply and EV battery done over the physical electrical connection. As per wireless charging system, as shown in the Fig. 1 that omits physical contact and the transmission of power depends on electromagnetic induction principle. This method is extensively used in mobile charging applications. Due to extensive research this method extending for UAV and EV charging applications[3]. Wireless charging mainly classified into two types: stationary wireless charging and dynamic wireless charging. Range anxiety might be overcome by the dynamic charging method. In this method EVs are charged by roadway powered systems. The transmitter coils embedded on the roadway pavement. Therefore, this method allows the vehicle charging while moving and received power could be directly given to the motor drive or battery system.

This method eliminates long charging hours and also reduces battery carrying capacity of the vehicle, which indirectly helps in the performance of EV. In addition, WCS also have other advantages over plug-in charging systems. Mainly, automatic charging operations hardly difficult to implement through plug-in charging

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Sensor-less field orientation control for brushless direct current motor controller for electric vehicles

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ARTICLE INFO

ABSTRACT

The electric vehicle traction of Brushless Direct Current Motor (BLDCM) is better from other electric machines due to its magnetic flux linkage, power to weight ratio and so on. The conventional Field Orientation Control (FOC) scheme with sensor for BLDCM has few shortcomings like deviation of current and thrust characteristics. In this paper, we have proposed a sensor less FOC for BLDCM. The back emf and speed of machine are estimated using slide mode controller which is given as a feedback to the motor controller part. The results are observed by varying reference speed which results in controlling the speed of machine accordingly. The results are verified by simulation and experimental evaluation. Simulation is done through MATLAB 2020a software and the experimental evaluation is done through Altair Embed Emulator which controls the BLDCM.

1. Introduction

The BLDCM is known to have high efficiency, reduced size and high torque which are essentially the most important factor to start the motor. Hence the Brushless Direct current motor is seen to have wide application in industrial products and automobiles [1]. The BLDCM is also known as electronically commutated motor as these motors are run on Direct current through an inverter source to feed the motor with an Alternating Current (AC) supply [2-3]. Every stator phase of the BLDCM is driven via a closed loop controller. The main usage of a closed loop feedback controller is to provide current pulse to the motor stator windings so as to have a control over the speed and torque and as both are complimentary phenomena in a motor. The Permanent Magnet Synchronous Motor sees a very similar construction to that of the BLDCM [4-5]. The main switching of industries from brushed motors to brushless motors is because of high power to weight ratio, low maintenance, and high speed [6-7]. In the late 20th century there was a significant boom in the field of solid state devices and semiconductor electronics, which allowed the shift of motors with com-

mutators and brushes to brushless [8-9]. The Hall Effect sensor detects the rotor angle of the rotating part, and converters control the IGBT switches, it helps in maintaining the alternations of current in the trapezoidal windings, the back electromagnetic field (EMF) current reverse direction, or every 180-degree conduction mode the switches will be OFF and electromagnetic torque flows unidirectional. The brushes are not available in the BLDC motor which reduces the friction and avoids frequent maintenance, thus the life time has been increased. [10-11]. BLDCM converter commutation process is deploying from computer software tools, or other techniques to deployed from hardware like microprocessors, or digital signal processing (DSP), or field programmable gate array (FPGA) or dspace [12-13].

Commutation with brushless motor based electronic circuits rather than conventional brushes in dc motor allows for larger capability which cannot be derived from brushed motors, including speed limiting, small stepped working for slow and smooth control of rotational force, and a reverse torque that holds the rotor when not in motion. The program used for the microcontroller can be changed according to the needs and wants of the motor based on the application [14]. The microcontroller uses the regular brushes functionality needed for the rotor's orientation. The rotor position can be detected and measured by Hall Effect sensors. This is triggered automatically in brushed motors due to the fixed

Minimum device usages of field programmable gate array (FPGA) verification of multilevel PWM inverter drive generation

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ARTICLE INFO

ABSTRACT

Space Vector Pulse-Width Modulation (SVPWM) has now become an unavoidable PWM in the power electronics inverter development. If the SVPWM implementation can be made user-friendly, the operation can be easily soaked in by the future researchers and also the closed loop operation becomes sophisticated. This paper conveys a broad view about the state of art of different Field programmable gate array (FPGA) processors along with the inner views about the implementations of the 3-level SVPWM. The description of the different processors is discussed along with the implementation variance and also attempts to implement the SVPWM through Xilinx Spartan—III 3AN-XC3S400 using MATLAB-Xilinx System Generator (XSG) without deploying the direct Very High Speed Language (VHDL) code. It provides shortest translation designs into hardware implementations that are faithful, synthesizable and efficient, which permits the designer to minimise the time spent for the description and implementation of circuit. The synthesis result shows that the proposed implementation at 50 MHz frequency operation consumes a power of 13mW and occupies 1112 look up tables (LUTs) and 424 File File (FFs). Thereby, the Total Resource Utilization reduced drastically to 36%, which is far better than the other existing implementations. Also, the inference of less processing time can be seen from the synthesis.
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1. Introduction

In comparison to a general two-level inverter, Multilevel Inverters (MLIs) give remarkable advantages and offer a very high valued features like: generates near sinusoids with lower harmonic distortion, high power outputs with lower dv/dt stress on switches, low switching losses and less common mode voltage etc [1]. Among various PWM technique for MLI, space vector PWM (SVPWM) is an advanced, have drawn a significant amount of attention from many researchers [2]. It has been shown to generate less harmonic distortion in the output voltages and/ or currents and provides more efficient use of supply voltage in comparison with sinusoidal PWM technique [3]. Due to the complex structure in SVPWM, the real implementation is very thought-provoking. Hence, the investigation of the MLI SVPWM should be very much required in teams

of its reduction of the complexity and implementation [4]. PWM control with a Digital signal processors (DSPs) were common has the advantages of its simple software control and flexibility in adaptation to various bids. However, for complex system, the DSP requires high processing power and system architecture which is not possible in affordable cost [5]. Similar to DSP, different digital platforms like dSPACE, Opal—RT (real time), Field programmable gate array (FPGA) etc. are commercially available for Hardware-In-Loop (HIL) simulation for power electronics applications [6]. Excluding FPGA, other hardware platforms are expensive with limited functionalities. Credits for the rapid growth of FPGA technology is to be given for the fact that there is an improvement in the FPGA architecture. Both the Spartan and Virtex processors are developed on a Very High Speed Language (VHDL) to carry out the implementation into FPGA [7,8]. As an alternative, the same can be achieved using MATLAB/Simulink- Xilinx System Generator (XSG) tool, which give easy and effective routine to design,

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Extended over modulation zone three-dimensional SVPWM for three-level neutral-point-clamped

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ARTICLE INFO

ABSTRACT

In the current era, pulse width modulation (PWM) techniques for multi-level inverters (MLIs) are widely for electrical drivers and renewable energy powering applications. Particularly, space vector PWM (SVPWM) takes a lot of interest as it has direct control in capacities with control variables, which deliver the straightforward MLIs switching vectors. Viewing the industrial induction drives, the three-phase neutral point MLIs families are the most preferred ones. These drives need wide speed-power characterizes. Hence to the overmodulation (OVM) boundary operation is recommended. However, the extended SVM overmodulation operation uses large mathematical calculations which need a higher-end digital platform to implement. The near state 3 dimensional (SD) SVPWM is an interesting switching method since it has a fast mathematical framework. The OVM based 3D SVPWM is innovative and not attempted. Hence, the paper proposes the new 3D SVPWM in the OVM region, which helps to increase the MLI fundamental voltage with minimal computations process for three-level MLI. The proposed method is not only independent with a number of inverter levels; it correspondingly does not need lookup-tables (LUTs) for the real α-β coordinate. The proposed 3D is verified through simulation and feasibility is demonstrated through experimentation.

1. Introduction

In current era, multilevel-inverters (MLIs) are extensively used in the area of medium-voltage electrical and non-electrical applications. MLIs are used in high-voltage electrical drives and renewable energy system HVDC, power compensation equipment. MLIs have been mainly classified majorly into three types (Neutral - Point Clamped (NPC) inverter, Capacitor-Clamped, Cascaded H-bridge MLI. The NPC-MLI is deserving candidate among all other MLI topologies configurations, since it has similar structure like conventional two-level inverter [1]. MLIs is operation, space vector PWM (SVPWM) is a canny method owing to the succeeding merits. (1). It uses the control variable directly to control inverter system as well as finds each switching options in orthogonal α-β complex space, (2). It utilizing the more input dc-link voltage, reducing and (3) The voltage and current Total Harmonic Distortion (THD)

is less. In SVPWM, when the reference voltage vector is crossing outside the space vector diagram (SVD) by changing the inverter modulation index (m_a) is called as over modulation (OVM). In recent times, numerous methods to realize 2-D SVM in both linear and over modulation range for MLIs have been offered [2,3]. As related to 2-D SVPWM, mathematical complexity and computational rate of 3-D SVPWM are less [4]. Previous practices were used in three-phase inverters [5]. However, 3-D SVPWM in OVM region is not reported yet in the literature. These methods are successfully operating the inverter [6,7]. However there are used high mathematical equations for calculating the coordinating vectors. In [3], a 2D OVM is used with complex function and achieved high fundamental output voltages for three-level inverter. The similar approach is used reported in OVM region with the trade-off between the fundamental voltage and complex functions, this method need higher LUT. In [8–10], a two-dimensional (2D) SVM for a three-level MLI is discussed. The struggle in establishing the position of the target reference vector(V_{ref}) accounts for the complexity. The 3D space vector approach of MLI is utilised by Wong

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Performance Analysis of Five Phase NPC MLI with Phase Shifting Carrier Pulse Width Modulation

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Abstract

The five-phase loads with Multi-Level Inverters (MLI) are preferred by industries in high and medium power applications due to lower switching loss, voltage stress across switches, etc. The controlling of five-phase motor drive is done by Pulse Width Modulation (PWM) techniques. This paper discusses about different multi-carrier PWM techniques such as Level Shifting Carrier (LSC) PWM and Phase Shifting Carrier (PSC) PWM techniques available for controlling the inverter drive. The simulation is carried out for all PWM techniques and load voltage, voltage THD, Common Mode Voltage (CMV) and DC-link voltages are noted and compared among the PWM techniques.

Introduction

The multi-level inverters are used in most of the power electronic industries for its better harmonics performance, lower switching stress, lower losses etc. As the number of level increases, the output waveform of inverter will be closer to sinusoidal waveform (1, 2). The MLI are categorized as Neutral Point Clamped (NPC) Inverter, Cascaded H-Bridge (CHB) Inverter and Flying Capacitor (FC) Inverter. The NPC MLI is simpler in construction point of view, also it produces less leakage current and high efficiency. The control system gets complicated in FC inverter as the number of level increased, while in CHB inverter, number of required DC source is high (3). Thus, NPC inverter is preferred in this paper. The NPC MLI is controlled by various PWM strategies like LSC PWM and PSC PWM as shown in Figure. 1.

The LSC PWM is classified as Phase Disposition (PD) PWM, Phase Opposition Disposition (POD) PWM and Alternate Phase Opposition Disposition (APOD) PWM (4 - 6). The level of each carrier signal is changed in LSC PWM techniques, while the phase angle is varied in PSC PWM techniques (7 - 10). Many researches has been carried out in PWM techniques for three phase inverter drives (11). The CMV and Neutral Point

Design of Mono Stage LUO Converter for Electric Vehicles Charging System

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Abstract

The Electric Vehicle charger with modified LUO converter is proposed in this paper that has High-Frequency Transformer (HFT) to isolate the input and load side. The primary of the HFT contains two switches and two diodes that reduces the voltage stress in switches. The proposed topology operates in Discontinuous conduction mode (DCM) which reduces the components and control complexities of the converter. The charger is operated in Constant Voltage (CV) - Constant Current (CC) modes which increases the battery life at long term. The proposed topology delivers better performance that is evaluated by performing the simulation in MATLAB/Simulink. The resultant output voltage from modified LUO converter charges the battery of 48V.

Introduction

The Electric Vehicle (EV) is gaining more attraction in recent years due to the reduction of pollution and increase in fuel costs. The commercialization of EV is still struggling to find a better solution for charging facilities due to the lack of charging stations and time required for charging the EV. The research in charging infrastructure is increased in recent years to increase the charging facilities [1]. The Light Duty EVs have huge demand among the customers, but due to lack of charging facilities the distributors and consumers are worried to utilize the EV in their daily routine. The Government of India has created the standards for EV charging and battery swapping technologies to avoid confusion for the charging station providers. In [2], a charger with coupled winding structure is designed that reduce the current stress and switch voltage. But this arrangement results in the complexity of the isolation transformer and makes it bulky. The voltage stress in semiconductor devices is high with the singe-stage single switch configuration that results in lower efficiency [3]. The non-isolated negative output LUO Converter is discussed in [4], which gives better performances like lower input and output ripple, higher voltage conversion ratio, etc.

Experimental investigations on mechanical and water absorption properties of epoxy resin-banana fiber-tamarind seed particles hybrid biocomposites

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ABSTRACT

In recent years, a variety of natural resources have been used as reinforcing and filler components in the development of hybrid bio-composites. The epoxy resin matrix was subjected to trials in which tamarind seed powder and banana fiber were added. Banana fiber and tamarind seed powder are used as reinforcement materials. Hybrid bio-composites samples were developed by varying the weight percent of reinforcement materials while keeping the epoxy resin weight percentage constant. Biopolymer composite boards were produced by hot injection moulding. The water jet machining procedure is employed to cut out hybridized biocomposites sample for different mechanical and water absorption tests from the hybrid biocomposites boards. The incorporation of a small amount of tamarind seed powder and banana fibre into the epoxy resin matrix considerably improves the hybrid biocomposites' mechanical and water absorption capabilities.

1. Introduction

Materials and products based on sustainability principles were created by researchers in fast developing countries to reduce environmental degradation and resource depletion [1]. Polyolefin, a non-biodegradable plastic, can be partially replaced by natural fillers to address the issue of waste management. Research suggests that natural fillers might strengthen polymer-based composites [2–3]. Even though natural fibres have a lower tensile strength than conventional materials, they have received a lot of interest in the structural domain. Natural fibre composite structures play an important role in numerous application sectors because of their greater strength to weight ratio [4]. Banana fibre, which is readily available, was utilised as reinforcement in this study's vinyl ester resin matrix. When compared to fresh resin matrix, mechanical characteristics have showed an improvement in strength (non-reinforced matrix). Banana fibre can be strengthened in a vinyl ester resin matrix with increased mechanical properties, making it useful in engineering applications [5]. Composites were created by moulding jute and banana fibres into an epoxy matrix in a variety of weight ratios throughout this study. In jute/epoxy composites containing up to 50 % banana fibre, mechanical and thermal characteristics are improved and moisture absorption is reduced [6]. Tests are conducted to evaluate the mechanical characteristics, like tensile modulus, flexible modulus and impact strength, according to ASTM standards. The composite's water absorption capability is being investigated in addition to its mechanical qualities. Banana fibre was found to be an effective reinforcement in epoxy matrix in this study [7]. Epoxy resin-based hybrid (glass/banana) composites are vital in the development of lightweight structural materials, thus the use of reinforcing fiber loading fiber in epoxy resin is of particular importance. Mechanical characteristics of the glass/banana composite have been demonstrated to be superior [8]. Using banana fiber-strengthened biocomposites and Camellia Sinensis particle-filled biocomposites, they were able to verify the impact and hardness criteria [9]. In an experiment, composites made from an epoxy resin matrix and banana fibers had

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An Image Denoising Scheme Remove Unwanted Pixel Using NLM with Sprint Deep Learning Network

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Abstract: An automatic image processing system is vital for detecting life-threatening diseases like tumor diagnosis. Machine learning is significant in processing medical images to detect the diseases' signs and symptoms. The essential need for image processing is the earlier detection of diseases. But due to the image complexities, the inefficiency of the conventional methods delivers poor performance in detecting the damaged cell's shape, extraction, exact size, and location. The primary goal of achieving an enhanced automatic system for preprocessing, classifying, segmenting, detecting, and sample recognition remains a challenging task. To overcome this, we proposed an improved SPRINT algorithm with NLM (Non-Local Mean filtering) algorithm. The proposed mechanism computes the original images to remove the noises, and the non-local filtering algorithm considers the high-extent redundancy of the normal images. As a result, the input images are processed using the weighted average value of the entire pixel to obtain noise-free or noise-less pixel images. Additionally, the SPRINT algorithm applies the minimum description length principle for achieving accuracy in the expected details. It contains an attribute table and histogram for holding the indexing of data records, class identification, and attribute values. Finally, our enhanced SPRINT can solve this trouble by preserving the fine details of an image while denoising. To evaluate the performance of the proposed system, a comparison work is carried out between the enhanced SPRINT algorithm with a conventional neural network (CNN) [12] and deep learning-based patch label denoising methods (LossDiff) [13]. The proposed SPRINT algorithm achieves 97% accuracy, which is far better than the CNN with 91% and LossDiff with 85% accuracy.

Keywords: Image noise, Machine learning, Deep Learning networks, non-local means algorithm, Image classification, and Segmentation

Introduction

Digital images play a vital role in several domains like signature approval, medical diagnosis, traffic monitoring, handwriting recognition, signature approvals, etc. The image sensor is a commonly used approach for collecting the image datasets. But these images are subject to various noises due to natural occurrences and defective devices. It results in delivering of poor-quality images. Image denoising is an effective approach for inspecting and removing the noises from the images. At the same time, it will retain a maximum of original details from the images. The resultant de-noised image is free from image noise. [1-5]. Image denoising is considered a major hurdle and complex task in image processing. The need for effective image processing, especially in the medical field, has grabbed much attention among researchers.

In recent days, several denoising techniques are evolved using various algorithms. But the existing conventional machine learning is effective in resulting the accuracy. The computer-aided techniques are failed to manage this complicated process resulting in image blurring or images with fewer details [6-11]. We proposed a SPRINT algorithm with a minimum description length principle for achieving accuracy in the expected details. The proposed mechanism contains an attribute table and histogram for holding the indexing of data records, class identification, and attribute values. A comparison work is carried out between the proposed SPRINT algorithm with a conventional neural network (CNN) and the deep learning-based patch label denoising method (LossDiff).

2. Related work

Shreyasi Ghose et al. [12] proposed a conventional neural network for image denoising. About 10% of gaussian white noise is added to the input image, and the CNN model is utilized for denoising. Then the quantitative analysis is performed on the PSNR (peak signal to noise ratio), MSE (mean square error), and SSIM (structural similarity index measurement). The result shows maximum Gaussian noises are removed by restoring the image's original details.

MurtazaAshraf et al. [13] proposed a deep learning-based patch label denoising method (LossDiff) for enhancing the classification accuracy of the whole-slide image analysis. The main motto of this work is to address the patch-based label noise, which results in low classification accuracy. The proposed system

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. Very effective in classifying the noisy patches and correctly labeled patches.

Jianwei Tian et al. [14] conducted a comparative analysis of the deep learning technologies used for image denoising. Initially, the author examines the CNN approaches various noisy images such as noisy white images, noisy hybrid images, real noisy images, and blind denoising. Then various kinds of deep learning methods are analyzed with their principles and research motivations. Finally, comparison work is conducted based on the quantitative and qualitative analyses concerning the public denoising datasets. Saeed Izadi et al. [15] researched various deep neural network-based image denoising methods. Initially, the author highlights the basic requirements in image denoising and denoising problem in handling the benchmark datasets. The author categorizes deep denoisers into supervised and unsupervised methods in this work. Each method's technical specifications and challenges facing real-time applications are discussed in detail.

Later, Cheng et al. [16] developed a novel subspace attention module for reconstructing the images with original details and removing the irrelevant information. Hu et al. [17] proposed an advanced 3D auto-correlation mechanism for instantaneously extracting horizontal, vertical, and channel-wise axes. Compared to the regular auto-correlation attention modules, the 3D module is lightweight, avoids impenetrable links, and performs optimized operations.

Zamir et al. [18] implemented a supervised attention module for a multi-stage architecture. A cross-stage information exchange module is introduced at the early stage of image denoises to enhance the feature fusion. Liu et al. [19] developed a noise component replacement mechanism through corresponding encoding. Initially, the noisy input is converted into a low-resolution clean image.

Li et al. [20] proposed a cross-patch graph convolutional approach for handling cross-patch long-range contextual needs. Similar patches are collected as primary patches, and features are extracted using ensembles for an accurate, clean patch.

3. Gaussian Filtering

Gaussian filters change the input signal using Gaussian functions to remove noise from the noisy input image. These Gaussian functions are employed in various fields, such as (i) these are used to explain the probability function of noise, (ii) Gaussian functions are also employed in mathematics (iii) these are smoothing workers. A gaussian function is given below:

$$G_u(a) = \frac{1}{\sqrt{2\pi\sigma^2}} e^{\frac{-a^2}{2\sigma^2}}$$

(1)

Generally, two 2-D Gaussian functions are employed for imaging functions, and it is given by:

$$G_u(a,b) = \frac{1}{2\pi\sigma^2} e^{\frac{-a^2+b^2}{2\sigma^2}}$$

(2)

The above function (Eqn. 2) is a simple product of two 1-Dimensional Gaussian functions. Eqn. 2 σ represents the standard deviation of the Gaussian function. a denotes the distance from the source on the x axis, and b mentions the distance from the source on the y axis. Then, a convolution matrix is formed from the values acquired from the above

correlation function. This convolution matrix is only sensitive to the original transmitted image. The Gaussian filters are also known as non-uniform low pass filters. It is a very effective method for noise removal, and the pixel weights afford higher significance to the edge near pixels. Gaussian filters are computationally so efficient. The noise removal takes more time, reducing the image's fine details.

4. Median filtering

The median filters are known as non-linear filters and use non-linear filtering approaches to remove image noise. Image edges are preserved during the noise removal process using this median filtering. For that reason, median filters are mostly employed in various image processing techniques for noise removal. The median filters are run through the noisy image pixel by pixel and then replace the detected noisy pixel with neighboring median pixels. The outline of adjacent pixels is known as a 'window'. The median filtering function is given by,

$$\gamma = \begin{cases} X_{(n+1)/2} & if\ n\ is\ odd \\ \frac{1}{2}(X_{n/2} + X_{1-n/2}) & if\ n\ is\ even \end{cases}$$

(3)

Where n represents the number of pixels present in the window, i.e., window size. If the window size is odd (i.e., it contains the odd number of pixels), then the median value is easily estimated, which is the middle value of a numerically sorted window. More than a median is present if the window possesses an even number of pixels. Median filters are a kind of linear Gaussian filtering, and it is a type of smoothing technique. It preserves sharp image edges. The calculated median measure is similar to the neighboring pixels, which will not impress the other pixels. It preserves the image boundaries. It provides poor performance in the removal of Gaussian noise. It can remove noisy pixels only if the noise-affected pixels take up less than half the neighboring region.

5. Wiener Filtering

The Wiener filter is an optimally stationary linear filter employed for additive noise and image blurring. The design function of the wiener filter assumes a dissimilar approach. The first assumes the knowledge of the master signal and the spectral noise properties. The second one is a linear time-invariant filter that produces the output close to the master signal as much as possible. At first, some assumptions have to be made to calculate the filter function: original signal and image noise (additive) are stationary linear and random processes with known spectral properties, including auto-correlation and cross-correlation functions. The requirement of this filter is it must be physically manageable/casual. The Wiener filter is given by,

$$y(t) = g(t) * [x(t) + n_a(t)]$$

(4)

Where $g(t)$ is the impulse response of the wiener filter, $y(t)$ is the estimated signal. $x(t)$ is the original input signal, and $n_a(t)$ is the additive noise signal. This filtering technique uses prior statistical knowledge of noise. Hence, we can obtain efficient noise removal. By using this statistical information, we can minimize the mean square error. Wiener filter cannot preserve the fine image details while image denoising takes place.

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An efficient and secure data sharing scheme for cloud data using hash based quadraplet wavelet permuted cryptography approach

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Summary

Ensuring the reliable and secure data transmission in cloud systems is very essential and demanding task in the recent decades. For that purpose, various security frameworks have been deployed in the existing works, which are mainly focusing the improving the privacy and confidentiality of cloud data against the unauthenticated users. Yet, it facing the major problems of inefficient accessing, increased time consumption, computational complexity, storage complexity, and memory utilization rate. Hence, this research work intends to develop an advanced and efficient cryptography model, named as, hash based quadraplet wavelet permuted cryptography (HQWPC) for the secured cloud data storage and retrieval operations. Here, the bilinear mapping and group hash function generation processes are performed to generate the keys used for cryptographic operations. Also, the zig-zag scanning, wavelet coefficients extraction, and permutation processes are accomplished for data encryption. Consequently, the inverse of these operations is performed while decrypting the data. In addition to that, an integrated signature control policy authentication mechanism is employed for validating the authenticity of the cloud data users. This kind of signature verification process could efficiently increase the security level of cloud data. For validating the performance of the proposed security framework, various evaluation metrics have been utilized during analysis. Then, the obtained results are compared with the recent state-of-the-art models for proving the efficiency of the proposed technique over the other techniques.

KEYWORDS

bilinear mapping, cloud data, confidentiality, group hash function generation, hash based Quadraplet wavelet permuted cryptography, privacy, security, signature controlling policy authentication

1 | INTRODUCTION

In the present days, cloud[1,2] has gained an increased attention by many research developers for an efficient data storage and retrieval functions. Due to its enormous benefits to the users,[3-5] it is extensively applied in many real application systems like healthcare systems, industrial data storage, biometric authentication, banking systems and so on. It offers the benefits of better collaboration, reduced maintenance cost, flexibility, efficient data accessing, and huge data storage.[6] However, ensuring the security of data[7,8] stored in cloud systems is still remains the challenging and most

An efficient and secure data sharing scheme for cloud data using hash based quadraplet wavelet permuted cryptography approach

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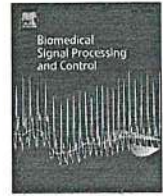
Lung disease detection using Self-Attention Generative Adversarial Capsule network optimized with sun flower Optimization Algorithm

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ABSTRACT

Lung cancer is the uncontrolled growth of abnormal cells in one or both lungs. This is one of the dangerous diseases. A lot of feature extraction with classification methods were discussed previously regarding this disease, but none of the methods give sufficient results, not only that, those methods have high over fitting problem, as a result, the detection accuracy was minimizing. Therefore, to overcome these issues, a Lung Disease Detection using Self-Attention Generative Adversarial Capsule Network optimized with Sun flower Optimization Algorithm (SA-Caps GAN-SFOA-LDC) is proposed in this manuscript. Initially, NIH chest X-ray image dataset is gathered through Kaggle repository to diagnose the lung disease. Then, the chests X-ray images are pre-processed by using the contrast limited adaptive histogram equalization (CLAHE) filtering method to eliminate the noise and to enhance the image quality. These pre-processed outputs are fed to feature extraction process. In the feature extraction process, the empirical wavelet transform method is used. These extracted features are given into Self-Attention based Generative Adversarial Capsule classifier for detecting the lung disease. The hyper parameters of SA-Caps GAN classifier is optimized using Sun flower Optimization Algorithm. The simulation is implemented in MATLAB. The proposed SA-Caps GAN-SFOA-LDC method attains higher accuracy 21.05%, 33.28%, 30.27%, 29.68%, 32.57% and 44.28%, Higher Precision 30.24%, 35.68%, 32.08%, 41.27%, 28.57% and 34.20%, Higher F-Score 32.05%, 31.05%, 36.24%, 30.27%, 37.59% and 22.05% analyzed with the existing methods, SVM-SMO-LDC, CNN-MOSHO-LDC, XGboost-PSO-LDC respectively.

1. Introduction

Lung disease is the most prevalent disease globally [1]. Lung disease is a massive risk for growing countries and central income countries (many people facing poverty) [2–3]. The World Health Organization reports that illnesses related to household air pollution, such as asthma and pneumonia, causing almost 4 million deaths each year [4–6]. To detect lung disease, the effective diagnostic techniques must be required [7]. Since late December 2019, COVID-19, a new corona virus disease has been seriously damaging lungs and creating breathing issues [8]. The COVID-19 virus or other viral or bacterial infection may be the cause of pneumonia [9–13]. Therefore, early lung disease detection is more crucial than ever. Deep learning and machine learning are extremely useful for this. Recently, the importance of digital technology has increased globally [14]. This study presents a direction of lung disease detection utilizing deep learning model to doctors and other

researchers [15–17]. A huge count of lung X-ray imageries is employed as a dataset. The technique helps to exactly identify diseases, which save people who are vulnerable and lower disease rate [18,19]. Health scheme is not deliberated owing to the growth of population. It involves pneumonia, asthma, tuberculosis, fibrosis, chronic obstructive pulmonary disease and so on. Early diagnosis of lung disease is vital for patient lives [20,21].

Several lung disease classification models were suggested in the literature [27–38], but, those models have certain limitations, like low detection rate for normal samples. If how it is, compared to the high fraction of abnormal samples, during classification process the accuracy of normal is exactly classify, but decreases the accuracy of abnormal. Some models does not exactly classify the abnormal, they shows the accuracy of normal region only and increased the error rate, a few more models displays the image accuracy but maximized the computational complexity. The proposed approach overwhelms all the drawbacks and

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Monodisperse ceria nanoparticles synthesized one phase system by hydro-solvothermal method: Evaluation of its anticorrosive properties

R. Anandarasu, S. Surendhiran, S. K. Krishna, et al.

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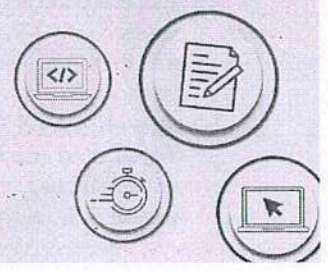
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Abstract. Monodisperse cerium oxide nanoparticles (CeO_2 NPs) were synthesized by one-phase system hydro-solvothermal method. UV-Vis, FTIR, PL, XRD, and SEM techniques were used to characterize the synthesized samples. The crystalline nature of CeO_2 NPs was revealed by the XRD analysis. FTIR was used to confirm the chemical bonding between Ce and O. In addition CeO_2 NPs exhibit broad photo luminescent peak at 415 nm and sharp photo luminescent peak at 602 nm. SEM analysis clearly exhibits the fascinating shapes like truncate cubic and sphere edges of CeO_2 nanoparticles. The electrochemical analysis namely linear sweep voltammetry (LSV) and impedance spectroscopy (EIS) shows that the Lauric acid employed CeO_2 NPs exhibits higher anticorrosive property in 1M HCl medium compared with NaOH involved CeO_2 NPs.

INTRODUCTION

Ceria nanoparticles are commonly prepared due to its usage in a variety of technologies and applications, including sensor [1], three-way catalysis [2], redox agent in organic reactions [3], photo catalysis [4], anticorrosion [5], solar cell [6], infrared reflective pigment [7], antimicrobial [8,] fuel cell [9], chemical mechanical polishing [10], ultraviolet absorbance [11], and oxygen storage [12]. Hydrothermal [13], solvothermal [14], hydrolysis [15], chemical precipitation [16], pyrolysis [17], sol-gel [18], sonochemical [19], and micelle assist method [20] were used to make cerium oxide nanoparticles. The hydrothermal process, for example, has advantages like increased crystallinity and morphology-controlled growth.

Due to the uniform properties of individual particles, high-purity nanoparticles with balanced size and shape are attracting a lot of interest in material chemistry [21]. Monodisperse nanoparticles are used in a variety of applications, including optical, catalyst, energy, and environmental applications. Micro-emulsion, controlled precipitation, sol-gel, and thermal decomposition of metal-organic precursors are all used to make nanoparticles of controlled size and shape [22]. *Huagu and M.D. Soucek* announced the development of uniform-sized monodispersed CeO_2 NPs by decomposing the cerium-oleate complex in solvent at high temperature [23]. *L.T.T. Tuyen et al* used two-phase approaches to make monodisperse uniform CeO2 nanoparticles [24]. *T.S.Sreeremya et al.* announced the synthesis of ultra-small monodisperse 2.3 nm CeO_2 NPs by ammonia precipitation of cerium nitrate in a mixed glycol-water solvent and phase transfer into polar solvents [25]. CeO_2 NPs were synthesized by

AUTOMATIC ACCIDENT PREVENTION SYSTEM FOR HEAVY PASSENGER VEHICLES

P. Chakravarthi, M.E.,

S. Jayaprakash, S. Rajasekar, M. Praveen, V. Satheesh Kumar

K S R Institute For Engineering And Technology Tiruchengode – 637 215.

ABSTRACT

In twenty of the countries composing the European Union (EU20), there are ap-proximately 800,000 buses, equivalent to 0.35% of the total road vehicle fleet (230 million vehicles), while 10% of road trips are made by bus. Given these rates, bus crashes account for very few events, involving less than 1% of total road fatalities (ERF, 2010). It is evident that despite the significance of crashes involving buses and the assumption that public transport improves road safety by reducing vehicular traffic few studies are available in the literature on crash data involving buses. The paper presents an overall analysis and comparison of crash data related to bus at European level. A more in depth study carried out at Italian National level provides a useful summary of practice in the area of bus safety management. The work focuses on the expertise of fleet managers to evaluate the effectiveness of different approaches and systems to reach higher safety standards. Results provide useful information on the state of the art and current practices of urban public road transport in the area of road safety. Start inhibition, automatic door opening, and bus materials and internal architecture were unanimously considered the top safety items for bus passenger safety. Brake assistance and vehicle monitoring systems were also generally considered very effective. So in this project we developing the kit with safely shield that make covering the tire they make over the accident person with the help of ultrasonic sensor.

Keyword:

Brake, Safety, Bus, Shield, Ultrasonic sensor, Arduino

1.INTRODUCTION

Road traffic safety refers to the methods and measures used to prevent road users from being killed or seriously injured. Typical road users include pedestrians, cyclists, motorists, vehicle passengers, horse riders, and passengers of on-road public transport (mainly buses and trams).As sustainable solutions for classes of road safety have not been identified, particularly low-traffic rural and remote roads, a hierarchy of control should be applied, similar to classifications used to improve occupational safety and health. At the highest level is sustainable prevention of serious injury and death crashes, with sustainable requiring all key result areas to be considered. At the second level is real-time risk reduction, which involves providing users at severe risk with a specific warning to enable them to take mitigating action. The third level is about reducing the crash risk which involves applying the road-design standards and guidelines (such as from AASHTO), improving driver behavior and enforcement. Traffic safety has been studied as a science for more than 75 years.

Analysis of Nozzle Spray Volumetric Distribution of Broadcasting and Banding Application Using SPSS Software

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Abstract:

The essential goal of agricultural spraying application system is to put the exact amount of insect killer, in the correct place, at the correct time to reduce the insect to a level below the economic threshold in order to improve agricultural production. A spray patternator was fabricated for the selection of a suitable nozzle to have uniform distribution of the spray liquid. Experiments were conducted on a spray patternator through two types of spray nozzles, one is even flat fan nozzle TPE (Thermoplastic Elastomers) for banding and another is standard flat fan nozzle TP (Thermoplastic) for broadcasting application. Spray distribution was determined and compared by using single nozzle, at a height of 0.5 m under laboratory conditions. In addition, the spray distribution was studied using spray fan angles of 65^0 and 80^0 and liquid pressures of 200 and 300 kPa. Banding nozzles provided the optimum spray application distribution, whereas broadcasting nozzles provided an inconsistent spray distribution with a high peak directly below the nozzle centre and taper off towards the spray pattern's margins. The results showed that increasing the nozzle angle and pressure reduces the value of the coefficient of variation for both types of nozzles evaluated.

Key words: Nozzle, Spray distribution, Patternator, Coefficient of variation.

1. INTRODUCTION

A nozzle is a device used to control the speed of the liquid stream, headings, and stream qualities. The structure of the nozzle is viewed as a pipe with shifting cross sectional zones all through the length for modifying and controlling the mass stream rate, speed, course of a stream, weight proportion, and so forth. The variety of weight contrast at the channel and outlet of the nozzle area brings about the difference in stream qualities. Nozzles can be classified as the convergent, divergent or both as convergent and divergent nozzles. The first ever nozzle was invented by German engineer named Ernst Korting in the year 1878.

Agricultural chemical can be applied according to the American Society of Agricultural and Biological Engineers (ASABE) Standards (2006) by broadcast application that uses spray over an entire field and band application that uses spray in parallel bands exit areas between the bands free of chemical [1]. Chemical control in row crops is typically carried out as a broadcast application by using standard flat fan nozzles and most farmers use this kind of application because it's the easiest and preferred method.

Actually, standard flat fan nozzles are not recommended for banded application as result to the following reasons: (1) These nozzles should be overlapped (a array of nozzles) to achieve spray uniform distribution across the entire width of the boom but using the overlapped spray in the row crop fields will cause losing of the spray among the rows or strips. (2) If these nozzles use without overlapping or as single nozzles above the parallel bands, the spray distribution will be uneven. However, management of the precision agriculture encourages decrease the use of insect killer in fields. The question is whether it's possible to use the existing even flat fan nozzles for spray distribution in very narrow bands instead of standard flat fan nozzles to achieve more efficient spray distribution in the fields.

Magnetic nano carbon balls - Synthesis and adsorption studies

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Madhuca longifolia oil used as precursor oil for the synthesis of nano sized carbon balls with a size of 50 to 100 nm. An indigenously designed reactor assembly is used for this synthesis. Low temperature direct pyrolysis method is employed with the help of multi-metal catalyst derived from *Alternanthera sessilis* stem ash. The synthesized carbon balls have a bulk density of 0.124 g/mL and BET surface area of 805.87 m^2/g. In-order to ensure the effective recovery of NCB, it is immobilized with a magnetic nano particle Fe_3O_4 and used for the adsorption studies of Acid Green 25 dye from aqueous solution under batch mode. Batch mode studies also proved the endothermic nature and physisorption mechanisms. The maximum Langmuir monolayer capacity of 243.90 mg/g has been achieved at a temperature of 45°C.

The fast growing human population all around the world exploits the natural resources in a rapid manner. To satisfy the increasing needs of human population, the fresh water resources are exploited. In another way there is a huge quantity of effluents are generated and let out into the water bodies, which also exploits the fresh water bodies. The discharge of these pollutants makes great implications on the human health. Among the different kind of pollutants, dye bearing wastewater are of great concern owing to their high toxicity and non-biodegradable nature. These effluents are released from plastic, paper, cosmetic, and textile industries. There are number of technologies available for the treatment of dye bearing wastewater. Applicability of these technologies is limited owing to the high cost and complicated technologies.

Adsorption using activated materials is a suitable method for the removal of complex organic dye molecules because of its simplicity, high effectiveness, reusability, and ease of process[1]. Several materials like Euphorbia antiquorum (L) wood[2], oil palm trunk fiber[3], pine sawdust[4], carbon developed from Arundodonax root[5], degreased coffee bean[6], bentonite[7], polyurethane foam[8], etc are used as precursor for the preparation of adsorbent.

The objective of the work is to synthesize highly active Nano Sized Carbon Balls (NCB) using *Madhuca longifolia* (Mahuwa) oil with a uniform and average size <100 nm using an indigenous reactor assembly through air controlled, low temperature direct pyrolysis with the help of multi-metal catalyst derived from *Alternanthera sessilis* stem. The synthesized NCB is used for the removal of organic contaminants through adsorption by batch and column mode after immobilizing with Fe_3O_4. The precursor oil for the synthesis of Nano Sized Carbon Balls is derived from the plant *Mahua longifolia*. It is an Indian tropical tree normally found in the forests of central and north India. It belongs to the family Sapotaceae. A matured tree can produce about 20 to 200 kg of seeds. The matured dried seeds are used for the extraction of Mahuwa oil. Mahuwa oil with a fatty acid composition of palmitic 24.5 %, stearic 22.7%, oleic 37.0 %, linoleic 14.3 %[9].

Experimental Section

Materials

All the chemicals used are of analytical grade purchased and used without further purification. All solutions are made using double distilled water.

Preparation of green catalyst

The muti-metal catalyst has been synthesized from the stems of *Alternanthera sessilis*. The air dried stems of *Alternanthera sessilis* are cut into a pieces of

Mechanical Properties Evaluation of Tib₂ & Nb Reinforced Aluminium 7075 For Pump Impeller Applications

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Abstract- *Aluminum composites were largely used in automobiles industries due to their light weight and corrosion free characteristics. Mechanical properties of Aluminum alloy were improved by the reinforced of TiB2. The composites were fabricated by three varying the volume percentage of TiB2 particles and Niobium. The three material matrix composites can be manufactured by stair casting method. These composites were evaluated for microstructure and mechanical property by FEA.The test results shows that overall mechanical properties of different composite samples were better than bare metal.*

Keywords- composite impeller, impeller manufacturing, SEM analysis, ansys modeling, tensile test

I. INTRODUCTION

The ever-increasing demand for light weight, fuel efficiency and comfort in automobile industries has lead to the development of advanced materials along with optimized design. The increased demand for light-weight materials with specific strength in the aerospace and automotive industry has spread the development and use of one group of composites: metal-matrix composites (MMCs). MMCs are widely used in industries, as they have excellent mechanical properties and wear resistance. MMCs have slowly replaced some of the conventional light-weight metallic alloys such as the various grades of aluminum alloys in applications where low weight and energy saving are important considerations and yet without sacrificing the strength of the components.

A metal matrix composite (MMC) can be defined as a metallic matrix (usually an alloy of Al, Cu, Fe, Mg, Ti or Pb) containing three-dimensional inclusions (usually an oxide, carbide or nitride).In these MMCs, the good ductility of the metallic alloy as the matrix material is retained while the modulus and strength of the composites are increased as a result of the reinforcement phases. By the correct combination of matrix material and reinforcements, MMCs can be tailored to give superior electrical, mechanical and even chemical properties. This is especially important in cases when monolithic metals and alloys can no longer fulfill the increasingly stringent requirements demanded by designers and engineers in newer engineering applications.

Metal-matrix composites (MMCs) exhibit the ability to withstand high tensile and compressive stresses by the transfer and distribution of the applied load from the ductile matrix to the reinforcement phase. These MMCs are fabricated by the addition of a reinforcement phase to the matrix by the use of several techniques such as powder metallurgy, liquid metallurgy and squeeze-casting. The inclusions in MMCs can be continuous fibres, discontinuous particulate or whiskers. Particulates make excellent inclusions, because they lead to predictable isotropic behavior in the composite. In addition some particulate metal matrix composites (PMMCs) are attracting attention because of their good mechanical, thermal and tribological properties. Particulate-reinforced composites cost less than fiber-reinforced composites owing to the lower cost of fibers and manufacturing cost.

Besides their increased strength, hardness and thermal conductivity, PMMCs have been found to have better wear resistance than the unreinforced matrix metal. Among the group of hard ceramic particles considered for inclusion in aluminum based MMCs B_4C particles have been found to have an excellent compatibility with the aluminum matrix and can be obtained at low cost. Their excellent wear resistance also makes these SiC- particle-reinforced aluminum (ZrO_2/B_4C) composites important candidate materials for use in automobiles as pistons, brake rotors, calipers, connecting rods and cylinder liners. The attention has been given to aluminum PMMCs which contain particles of boron carbide (B_4C) or ES. Such materials exhibit abrasive and sliding wear rates which are substantially lower than those of the unreinforced aluminum matrix. These hard particles have been found to be of great importance at high contact loads, because the particles serve to delay the transition from mild to severe wear.

Double Security System For Unlocking Automobile Ignition

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Abstract- *In the modern world security is one of the major issues. As technology is getting advanced many security issues are arising. A vehicle key is the only way to start the bike or to provide ignition to the engine. The face recognition based bike ignition system literally replaces the bike ignition by replacing the key with specific user face. While dealing with the topic the objective arises is the achievement of luxurious features and the safety concern, which can be achieved by means of the automotive electronics. In this project, we are proposing facial recognition system with the use of python programming .The options of facial recognition and detection have been taken into consideration just because it is widely used in the interactive user interface and plays a crucial role in computer vision. In the case of unauthorized/unknown access, the notification sends to the concerned authorities through an online application. There is a strong need for robust and efficient face detection algorithm. An efficient automotive security system is implemented for anti-theft using an embedded system for starting the ignition by the use of face recognition.*

I. INTRODUCTION

Currently, the emergence of industrial revolution in the autonomous vehicle sector is experiencing rapid growth. The advance autonomous technology involves many aspects in the vehicle, such as autonomous self driving, and full autonomous self driving. One of the importance aspect in advance autonomous vehicles is security system. Security system plays important rule in vehicle safety system, specially theft case and unauthorized person.

Nowadays, conventional security systems such as key, code pin, ID card, are very popular in many countries. However, the conventional security system has potential to be lost, stolen, or duplicated by someone. Furthermore, many of the traffic accidents occur mostly due to young vehicle drivers and theft due to vehicle security system . Based on these circumstances, it is necessary a security system able to prevent from car theft. One of the solution to the problem is by applying the security system which capable of activating only by the authorize person. The biometric identification system is one of the solution to authorize the person.

The biometric recognition system is unique and personal which very good implement for identification of a person. There are many recognition system based on biometrics, such as face of the person, fingerprint, signatures, and eyes.. The use of vehicle becomes important everywhere in the world and also preventing it from theft is required. Vehicle manufacturers are attaining the security features of their products by introducing advanced automated technologies to avoid the thefts particularly in case of cars. Biometric and non-biometric methods usually provide such security features. Sometimes these systems fail due to hacked Password and encryption of decrypted data, but it is almost impossible to make replica of distinctive characteristics. Biometric systems are modern and use techniques like fingerprint recognition, iris recognition and face recognition. Of these face recognition and detection systems are more sophisticated, easy to deploy and people can be identified without their knowledge.

Some advantages of facial recognition method for vehicle security application are:-

1. More convenient, sensed as soon as one is seated in position.
2. Low cost and a better approach to be used with existing methods.
3. Requires no active part of the user.

II. FACIAL RECOGNOTION SYSTEM

A facial recognition system is a technology capable of matching a human face from a digital image or a video frame against a database of faces, typically employed to authenticate users through ID verification services, works by pinpointing and measuring facial features from a given image. Development began on similar systems in the 1960s, beginning as a form of computer application. Since their inception, facial recognition systems have seen wider uses in recent times on smartphones and in other forms of technology,

Adaptive Control based Condition Monitoring of CNC Machine

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Abstract: An adaptive control constraint system has been developed for computer numerical control (CNC) turning based on the feedback control and adaptive control/self-tuning control. In an adaptive controlled system, the signals from the online measurement have to be processed and fed back to the machine tool controller to adjust the cutting parameters so that the machining can be stopped once a certain threshold is crossed. The main focus of the present work is to develop a reliable adaptive control system, and the objective of the control system is to control the cutting parameters and maintain the displacement and tool flank wear under constraint valves for a particular workpiece and tool combination as per ISO standard. Using Matlab Simulink, the digital adaption of the cutting parameters for experiment has confirmed the efficiency of the adaptively controlled condition monitoring system, which is reflected in different machining processes at varying machining conditions. This work describes the state of the art of the adaptive control constraint (ACC) machining systems for turning. AISI4140 steel of 150 BHN hardness is used as the workpiece material, and carbide inserts are used as cutting tool material throughout the experiment. With the developed approach, it is possible to predict the tool condition pretty accurately, if the feed and surface roughness are measured at identical conditions. As part of the present research work, the relationship between displacement due to vibration, cutting force, flank wear, and surface roughness has been examined.
Keywords: displacement condition monitoring, surface roughness, Adaptive control, , model based control system and flank wear.

I. INTRODUCTION

Condition monitoring is becoming popular in industry because of its efficient role in detecting potential failures. The use of condition monitoring techniques will generally improve plant production availability and reduce downtime cost. A reliable adaptive control system can prevent downtime of the machine or avoid unwanted conditions such as chatter vibration, excessive tool wear by allowing the opti- mum utilization of the tool life. In metal cutting, as a result of the cutting motion, the surface of workpiece will be influ- enced by cutting parameters, cutting force, vibrations, etc. But the effects of vibrations have been paid less attention. Prasad et al.[1, 2] presented an investigation for a tool condition monitoring system, which consists of a fast Fourier transform preprocessor for generating features from online acousto-optic emission (AOE) signals to develop database for appropriate decisions. A fast fourier transform (FFT) can decompose AOE signals into different frequency bands in the time domain. This method has also been widely used in the field of metal cutting, detect process changes like displacement due to vibration, tool wear, etc.
The drawback of modern computer numerical control (CNC) systems is that the machining parameters, such as feed rate, speed, and depth of cut, are programmed off- line[3]. As a result, many CNC systems are inefficient to run under the operating conditions that are far from op- timal one. To ensure the quality of machining products, reduce the machining costs and increase the machining effi- ciency, it is necessary to adjust the machining parameters in real time to satisfy the optimal machining condition at any given time as per modern condition monitoring strategy[4]. The control of CNC machining processes is presently receiving significant attention due to potential economic benefits associated with automated machining. Control techniques that have been developed for machining traditionally re- quire some form of parameter adaptation. The solution to this problem is adaptive control. An adaptive control system was introduced to the cutting process by Stute and Goetz[5]. The most frequently used systems are model reference adaptive control (MRAC) and self turning regulations (STR).

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Automatic Detection of Temperature And Mask Scan Entry System For COVID Prevention

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Abstract- To create a safe, COVID-19 free environment, we propose a dynamic Computer Vision based automated solution system focused on the real-time face monitoring of people to detect both face masks and body temperature in public places by using Host Computer to detect face mask protocol violations through an integrated camera and to monitor body temperature with the help of temperature sensor. In this project gate system fabricated and it will be used in entrance. One pneumatic cylinder is attached with gate. This cylinder has connected with 5/2 solenoid valve for automatic operation. The solenoid valve operated depends on ECU signal this system can operate depends upon the controller signal.

Keywords- covid-19, nodemcu, pneumatic cylinder, ESP32camera

I. INTRODUCTION

The novel corona virus covid-19 had brought a new normal life. India is struggling to get out of this virus attack and the government implemented lockdown for the long way. Lockdown placed a pressure on the global economy. So the government gave relaxations in lockdown. Declared by the WHO that a potential speech by maintaining distance and wearing a mask is necessary. The biggest support that the government needs after relaxation is social distancing and wearing of masks by the people. But many people are getting out without a face mask this may increase the spread of covid-19. Hence we are using image processing techniques for identification of persons wearing and not wearing face masks. In real time images are collected from the camera and it is processed in Raspberry Pi embedded development kit. The real time images from the camera are compared with the trained dataset and detection of wearing or not wearing a mask is done. The trained dataset is made by using machine learning technique which is the deciding factor of the result. The algorithm created by means of using a trained dataset will find the persons with and without wearing face masks.

II. LITERATURE REVIEW

[1] Dr R Senthilkumar et al (2021): The novel Corona virus had brought a new normal life in which the social distance and wearing of face masks plays a vital role in controlling the spread of virus. But most of the people are not wearing face masks in public places which increase the spread of viruses. This may result in a serious problem of increased spreading. Hence to avoid such situations we have to scrutinize and make people aware of wearing face masks. Humans cannot be involved for this process, due to the chance of getting affected by corona. Hence here comes the need for artificial intelligence (AI), which is the main theme of our project. Our project involves the identification of persons wearing face masks and not wearing face masks in public places by means of using image processing and AI techniques and sending alert messages to authority persons. The object detection algorithms are used for identification of persons with and without wearing face masks which also gives the count of persons wearing mask and not wearing face mask and Internet of Things (IOT) is utilized for sending alert messages. The alert messages are sent to the authority persons through mobile notification and Email. Based on the count of persons wearing and not wearing face masks the status is obtained. Depending upon the status warning is done by means of using buzzer and LED's.

[2] Saman M. Almufti et al (2021): The rise of COVID-19 pandemic has had a lasting impact in many countries worldwide since 2019. Facemask detection had been significant progress in the Image processing and deep learning fields studies. Many face detection models have been designed using different algorithms and techniques. The proposed approach in this paper developed to avoid mask-less people from entering to a desired places (i.e. Mall, University, Office, …etc.) by detecting face mask using deep learning, Tensor Flow, Keras, and Open CV and sending a signal to Arduino device that connected to the gate to be open. it detect a face in a real-time and identifies whether the person wear mask or not. The method attains accuracy up to 97.80%. The dataset provided in this paper, was collected from various sources. Modern artificial intelligence systems and machine learning algorithms have revolutionized approaches to scientific and

MODELLING AND ANALYSIS OF 2D DOUBLE U AUXETIC HONEYCOMB STRUCTURE IN RADIATORS FOR INCREASING HEAT TRANSFER

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ABSTRACT

The purpose of present work is to explore experimentally the study of thermal conductivity of auxetic honeycomb structure and use them in a thermal heat transfer application such as a radiator. The structure is evaluated using finite element analysis model and the results are discussed. The honeycomb structure features a unit cell geometry allowing in-plane auxetic (negative Poisson's ratio) deformations, and geometry parameters to be used to design the honeycomb configurations for multifunctional applications. The design model is designed with the help of CATIA v5 software and the analysis work is performed using ANSYS 17.0 software. In this, the design of the normal conventional radiator is modified and the fins are replaced with auxetic honeycomb structure to understand and propose the thermal conductivity of the auxetic honeycomb structure. The obtained results are compared with the normal conventional fin designs and the results are discussed. The main objective of the proposed idea is to explore and determine the implementation of auxetic materials in heat transfer component such as radiator.

Keywords - Conventional radiator, ANSYS 17.0, CATIA V5

1. INTRODUCTION

Auxetic materials are unique structured components which possess negative Poisson's ratio, which are mainly used for their impressive mechanical behavior when an external load is applied. The auxetic materials are known for their complex mesh design which act as an energy absorption medium when an external physical load is applied. The mesh design is well inter connected with each other and their area of exposure is also high. So, thereby using these auxetic mesh design in a heat transfer component to increase its thermal dissipation to its atmosphere and also increasing the components mechanical rigidity when an unexpected sudden load is applied on the component in its working atmosphere.

2. LITERATURE SURVEY

1) Pardeep, Harvinder, et al., (2014) had made the design and analysis of fins with various shaped extensions. Compare the heat transfer performances between the various extensions fins that designed. Fin with different extension such as rectangular extensions, triangular extensions, trapezium extensions and circular segmental extensions. By using the extension in the heat transfer is increased as compare to fin without extensions. The range of performance of fin with extension achieves 5% to 13% than fin without extensions. Here, the rectangular extensions result higher heat transfer than the other extensions and the effectiveness of rectangular extensions fin have a higher as compare to other extensions on fin.

2) K. Sathish Kumar, K. Vignesh et al., (2017) had made analysis of fins with various types of notches to enhance the heat transfer. Three types of notches were analyzed such as holes V- shaped notch and rectangular notch. The efficiency and effectiveness of the three notched fins are analyzed. This analysis results that rectangular notch has greater heat transfer rate compared to that of the fins without holes, fins with holes and V shaped fins. Here the modelling of the structural design and analysis of the fins with notches carried out by CREO 2.0 and CFD– fluent software.

3) Nasir, Bhushan, Nitish et al., (2019) had made a review about a Pin fin efficiency enhancement. The heat transfer rate is increased by changing the various number of parameters on pin fins. The parameters like fin spacing, fin geometries and temperature distribution. The theoretical analysis done based on Newton's law of cooling. The convection heat transfer enhanced either by increasing the values of convective heat transfer coefficient (h) or surface area of the material (As).

4) J.S. Hu, B.L. Wang et al., (2021) had made an enhancement of fatigue behavior for auxetic honeycomb structure under thermal cycling. The theoretical model is carried out to analysis the service life of the auxetic structure based on Paris's law. Here the analysis carried out for both Auxetic and Non – auxetic honeycomb structure. The result shows that auxetic structure have longer service life time than the non – auxetic

Design And Optimization of Automatic Air Blow In Vmc For Burr Removals

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Abstract- *This paper represents the design of an automatic air blow for the application of a burr removal in vertical machining center (VMC). The mechanism is controlled by pressure system in FRL unit hence it can be implemented in all VMC based machining operation in small scale as well as big industries for faster operation and less labor requirement. It eliminates the existing methods of manual air blow technique of burr removal. This effectively improves the productivity rate at the higher level in the machine shop.*

Keywords- Automatic air blow, VMC, FRL Unit, Pressure, Burr Remove.

I. INTRODUCTION

The conventional method for chip removing in VMC after machining process is manual, it is very time consuming and in non-automatic form. The existing method required each machine for each one-man results in more man power for machine shop so the manual method must be replaced by Automation. Automatic air blow of chip removal has received significant attention because automatic is reliable and reproducible. This not only reduce manual effort but also gives more time for marketing also prevent danger which might occur when human being works in hazardous environment. Automation greatly improves the profit and productivity; it is very scalable.

II. LITERATURE REVIEW

Deburring and burr control are two possible ways to deal with burrs. For both, an insight into current research results is presented. Finally, a number of case studies on burr formation, control and deburring in Burrs—Analysis, control and removal. [1]

Aurich et al. (2009), [2] state that burrs are sharp and may cause small injuries on finger to assembly workers. Furthermore, they may become loose during operation on a product and provoke damages.

Kilickap (2010) and Et.al. [3] studied the modeling and optimization of burr height in the drilling of aluminum alloy and stated that lower feed rates and cutting speeds are preferred.

M. Brezocnik et al [4], Proposed the genetic programming approach to predict surface roughness based on cutting parameters (spindle speed, feed rate and depth of cute) and on vibrations between cutting tool and workpiece. From their research, they conclude that the models that involve in the three cutting parameters and also vibrating, give the most accurate predictions of surface roughness by using genetic programming. In addition, feed rate has the greatest influence on surface roughness.

K. Kadirgama et al [5], Develop a surface roughness prediction model for 6061-T6 Aluminum Alloy machining using statistical method. The purposes of the study are to develop the predicting model of surface roughness, to investigate the most dominant variables among the cutting speed, feed rate, axial depth and radial depth and to optimize Surface Roughness Prediction Model of 6061-T6 Aluminum Alloy Machining Using Statistical Method the parameters. Response surface method (RSM) based optimization approach was used in that study. It can be seen from the first order model that the feed rate is the most significantly influencing factor for the surface roughness. Second order model reveals that there is no interaction.

Mandara D. Savage et al [6], Developed a multilevel, in-process surface roughness recognition (M-ISRR) system to evaluate surface roughness in process and in real time. Key factors related to surface roughness during the machining process were feed rate, spindle speed, depth of cut and vibration that had generated between tool and workpiece. The overall MR-M-ISRR system demonstrated 82% accuracy of prediction average, establishing a promising step to further development in-process surface recognition systems. Kim and Dornfled (2001)[7], carried out a cost estimation of drilling operation based on drilling burr control chart and Bayesian statistics. The cost of drilling operation consists of cost of hole making and cost of deburring. The procedure developed by them can be effectively used to minimize the total cost without sacrificing the hole quality and the productivity.
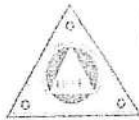
EV COMMUNICATION SYSTEM USING IOT MECHANSIM

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ABSTRACT

The mechanism for the implementation of the overall EV charging station uses the controller and communicate with the cloud using different IoT and MQTT protocols. This study is also completed by interface web-based and mobile for online monitoring. IoT-based communication system for Electric Vehicles (EVs) that utilizes a communication protocol that is MQTT. This system was designed using the Message Queuing Telemetry Transport (MQTT) protocol, which is a lightweight protocol that consumes very little system power. A Quality of Service (QoS) is the use of mechanisms or technologies that work on a network to control traffic and ensure the performance of critical applications with limited network capacity levels comparison was carried out to determine the suitable QoS level for this system. This result of this study is the enhancement of data quality and reliability using MQTT protocol. This system can detect lanes in real-time and store and send data to a remote location for vehicle monitoring.

KEYWORDS: *Electrical Vehicle; Internet of Things (IOT); Sensor; Cost*

INTRODUCTION

In recent days there are more changes in vehicle manufacturing, where all companies have advancement in production of vehicles and they are moving towards a smart vehicle environment. Thus, the usage of old engines has been replaced by new ones that produces much fewer hazards to the environment. In this way, electric vehicles which produce much less pollution have been introduced with many facilities which are very similar to normal vehicles that are present now. The speed, range and efficiency of electric vehicles are nearly equal when compared to diesel and petrol engine vehicles. In addition, these electric vehicles have a battery source which provides good benefits for travelling long distances. The users can select the type of battery and they can even monitor the charge in battery with the location of charging station. In this monitoring stage, a new monitoring device which replaces the old technology of Global Positioning System (GPS) has been integrated in necessary parts of the vehicles can be able to monitor the parameters like battery efficiency, distance of travelling, alert on charge and charging stations etc. The proposed work aims to provide an Internet of Things (IoT)-based solution for controlling the charges in vehicles and examines its usage in outdoor environments by transmitting data to long detachments. The purpose behind this projected method is to save the life of individuals because there is a possibility that the system will result in a short trail which in turn causes

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CRACKED EGG DETECTION FOR POULTRY INDUSTRIES USING IOT

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ABSTRACT

The crack on eggshell detection procedure employs image processing techniques and consists of seven steps, beginning with the input of egg image data into the system to obtain visual information. The JPEG extension is the sharpest and picture format, and it may be imported into the application for image processing. When the egg picture is seen, it then changes to grey. Then, for faster processing, convert the colour image to gray scale. Using the canny edge detector approach and interfering with image noise to find the edge. Then, within the chicken egg, locate and fill in the holes for it is possible to compute. Then, invert the colour to find a crack that is clear and compare it to an egg crack. Recognition and output are the final steps, and template matching recognizes template matching for high performance. The system would send image notification if it detected an egg crack.
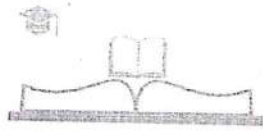
KEYWORDS: Image processing; Internet of Things (IOT); Easy detection; Cost

INTRODUCTION

Asia is the world's largest egg-producing area. 616 million dozen eggs are cracked each year, accounting for 38% of global output. The broken eggs were not employed in the culinary sector, hotels, or other similar establishments. As a result, the cost of transporting the cracked egg has doubled. Cracks are found before shipping in this approach, lowering costs. The eggs are collected from the chicken farm, placed on a tray, and delivered. Before being transported, eggs are inspected for any damage or cracks. Asia is the world's largest egg-producing area. 616 million dozen eggs are cracked each year, accounting for 38% of global output. The broken eggs were not employed in the culinary sector, hotels, or other similar establishments. As a result, the cost of transporting the cracked egg has doubled. Cracks are found before shipping in this approach, lowering costs. The eggs are collected from the chicken farm, placed on a tray, and delivered. Before being transported, eggs are inspected for any damage or cracks.

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CONTROLLING OF SURGICAL ROBOTICS PLATFORM FOR ENDOSCOPIC USING FUZZY LOGIC CONTROLLER

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ABSTRACT

In World-wide Colorectal Cancer is a most important morbidly portion occupying all the cancer types and the resection of the affected zone is the acknowledged appropriate alternative in oncological. Minimally Invasive Surgery (MIS) based on laparoscopy is accepted due to its shorter hospital stay and better aesthetic outcomes. The slope complex of the patient due to constraints of the robotic platform along with the risk of metastases at the port site has paved the way towards the developing of new robotics surgical tools for method of endoscopic like Endoscopic Submucosal Dissection (ESD) or Endoscopic Mucosal Resection (EMR), which have proven efficiency in the resection of cancerous tissues of all minimizing and reduced in invasiveness presented on MIS. The control system to be design of a novel miniaturized Robotic system for Endoscopic Dissection of gastrointestinal neoplasm by employing two types of commercial haptic interfaces (or) devices, where each one can be commanded to one of the two surgical arms, which are cautery arm and grabbing arm, of the detachable miniaturized robotics. The control strategy is based on a Master/Slave pattern, which is frequently used in Tele-operated systems, and it's composed of three units. The first one, developed in C Programming, this handles the haptic interfaces (or) devices that are guidance type and gathers the movement executed by the operator. The second one of process is this certain information and incorporating security loops to maintain a safe environment, then command the third one, which is composed by three DC motors that are integrated with the inside of robotics, that are handling with the cautery arm, and another three DC motors are kept in outside of the robotics and that are connected with cable systems, where each of these motors are manage with one degree of freedom of the grabbing tools. A gain scheduling PID algorithm, developed in Matlab and simulated with in Simulink based fuzzy logic control to enhance the adaptation to nonlinear aiming to improve the PI controller in the drivers (EPOS2 50/5) of the DC motors.

Keywords: Minimally Invasive Surgery, Haptic Interfaces (Or) Device, Fuzzy Logic Control, PI Control.

I. INTRODUCTION

The gastrointestinal interventions are complex due to the anatomical intricate shape and complicated access points the gastrointestinal tract presents. In World-wide Colorectal Cancer is a most important morbidity portion occupying all the cancer types and the resection of the affected zone? In Past, the open surgery was adopted in the resection of affected zone in the gastrointestinal tract was performed. The Drawbacks are risk of morbidity and infection for patients. In new methods reduce recovery time of patients, invasiveness is lower, the decline of all type of cancer recurrence, and improvement of surgical. Robotic surgical systems have been developed throughout the years, to increase dexterity along with the enabling simulation to enhancing the expertise or surgeons. The master/slave architecture is widely spread configuration when deals with the Tele-operated surgical systems. The design and consideration for reliability, safety and human robotic device (or) interfaces are important, and this responsibility is given out to implementation an accurate control systems. The PI controller has been implementing in Tele-operated surgical platform to be regulate with the velocity and angle positioning of the manipulators. The performance decline significantly and it can even lead to instability, if the motion is fast. Moreover PI controller cannot difficult with systems that fluctuate throughout time. The gain scheduling PI algorithms based on fuzzy logic controller have been proposed to be improving the performance of the Tele-operated robotic surgical systems. The robotic surgical platform for the resection of cancer tissue in the gastrointestinal tract is encouraging.

II. TELE-OPERATED ROBOTIC SURGERY

The robotics systems in the medical field aims to exploits and complement human capabilities since its prospective advantage are to upsurge the operational efficiency, to increase the dexterity and improve the

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Flood monitoring and alerting system using IoT

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ABSTRACT

Flooding is one of the major prevalent disaster occurring in various parts of the world. Flooding is among the major countries which occur in all places of the world and results in a massive quantity of damage to the environment. The problem occurs in a flash flood where the peoples may not have time to relocate their important things from the affected area to the safest area. As such, there is a need to develop a technology for monitoring and alerting the flood is necessary to our human kind.

Keywords: Flood monitoring, Arduino uno R3, Sensors, monitor.

INTRODUCTON

Flooding is one of the major problem in India. Major floods are occur in Uttarakhand, Tamilnadu, Kerala, Bihar, and Hyderabad. According to RBA the average annual damages caused by flood in our country in between 1953–2018. Monetary damages–5695 Cr, Houses damaged–1.2m, loss of life–2009 and loss of cattle life – 618248. In our proposed system the main hardware Arduino UNO is connected to the different sensors to check the current level of flood. This system not only monitor the level of flood but also alert the people and the government to minimize the impacts of food. This system is divided into three stages. They are Green alert, Orange alert, and Red alert. If the water is above 75% it indicates the orange alert and if the water level reaches 85% it indicates the red alert. It alerts the people using message, mail and also speaker various sources provided for alerting the people and the government.

RELATED WORK

The development of flood risk reduction, the difficult role is to first understand the hazardous phenomenon and the highly dangerous threats on the society. The IoT based systems are preferred by developers because it collect the data from different sensors without human interference. These systems are combined with water level sensors, ultrasonic for water level detection, water flow sensor for measuring water flow but the major drawback is that

it alert system. Pressure sensors were used to get water level measurements and at each second so that accuracy has been increased. The trend in that shows the usage of mobile phones is very common and almost 80% of the audience holds a smart phone. So this system not only alerts the people but also monitors the flood alerting system.

FLOOD ALERTING SYSTEM USING ARDUINO

In both developing and non developing countries, flood is the primary disaster that causes loss of human and animal life and also for property. Flood due to earthquakes in oceans, rainfall and other natural disasters occur simultaneously in many parts of the world in every year. During flood many lives, property and many things are get damaged. If we have any system which can give us early alert regarding flood and its damage then we can able to save lot of lives. If a system which uses technology to detect the flood level before we can able to save and evacuate lot of humans and animals and their property. So in this project we brings a prototype which can be used to detect water level in dam or reservoir and then send a alert using message, mail and buzzer. In this prototype we are going to use an Arduino UNO, ultrasonic sensor, buzzer, LCD, water flow sensor, PCB board and some connecting wires.

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IOT based coal mine workers safety monitoring and alerting system

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ABSTRACT

In this paper, a coal mine safety system is implemented using a Thinker Io platform as a medium to transmit the data. The system is implemented to monitor and control various parameters in the coal mines such as light detection, leakage of gas, temperature and humidity conditions, Fire detection in the coal mine. These all sensors are together considered as one unit and are placed in the coal mines. All the esteems of the sensors are continuously uploaded to the thinker for analysis. Here the gas is continuously monitored if any uncertainties in the level of gas arise, then buzzer is used to alert the workers. In this system LDR sensor is utilized to detect the presence of light. Automatically light gets one and can be controlled using the LED button. In case if any fire occurs in the coal mine, then an alert notification is sent to the mail of the authorized person. Temperature and humidity values are also continuously monitored and displayed on the serial monitor and also in the thinker platform. The developed system is mainly implemented to improve the working condition inside the coal mines and also to ensure workers safety

Keywords: LDR, Temperature, Humidity, LED

INTRODUCTION

...s overall essentialness use additions and customary oil resources decay, breaking development is one of the noteworthy progressions to improve the maltreatment of oil and gas resources.

It is unprecedented vitality for the improvement of low-vulnerability stores and the instigation of low-yield wells. In light of the capriciousness of the stratum, various perils will be looked during the time spent breaking improvement, especially sand plug, which is the most notable, causing financial disasters and natural tainting, pummeling spillage in the course of action, and scraps the advancement well, etc. At present, the Internet of Things (IoT) has been commonly used in different fields, which makes huge data assessment stacked with challenges.

Definite data examination is basic to develop reasonable logical models. The oil business is a little bit at a time moving towards knowledge. Different sensors presented at the well site which can assemble data set up an IoT circumstance. The examination of the data assembled at the well site is made arrangements for removing key information by using data mining development, which can recognize data designs, and direct peril desire. Right now, use of data mining

improvement is of uncommon immensity for avoiding the sand plug setback that occurs during the breaking technique.

LITERATURE SURVEY

"Capacitive Interfacing for MEMS Humidity and Accelerometer Sensors", Norliana Binti Yusof, Norhayati Soin, Siti Zawiah Md.Dawal, 2010, IEEE.

The paper proposes an early reprimand procedure for the risk of sand plug subject to twofold logarithmic twist. Directly off the bat, the coupled time region examination and GRNN figuring are used to predict the oil weight and bundling pressure parameters in the twofold logarithmic curve slant sand plug chance caution .What's more, a while later the inclination change is applied to perceive and condemn the sand plug, which can comprehend the early reprimand of sand fitting of breaking. Finally, in order to improve the precision of twist slant tally, the improved AP gathering computation is used to divide the oil weight and weight twist followed by twist fitting, at the same time figure the inclination of the fitted curve. The essential duties of the paper are according to the accompanying: (1) An early counsel model for the twofold logarithmic twist of sand connection of making is constructed laugh hysterically in the paper. (2) The time

International Journal of Intellectual Advancements and Research in Engineering Computations

Cold Supply Chain Risk Monitoring and Safety alerting System Using IoT

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ABSTRACT

The intake of the perishable fruits and vegetablesin the human diet can contribute to reduce the risk of some chronic diseases. But unfortunately, fruits and vegetables loss rate is high among all the food produced annually and occurs at storage stage of post-harvest life cycle. The study focused on reducing the customer complaints due to cold chain segment. A cold chain is a temperature-constrained supply chain. An ideal cold chain is a continuous series of refrigerated production, stocking and supplying activities, with the help of associated equipment and logistics, which maintains the desired low temperature limits. It helps in preserving and increasing the shelf life of commodities such as frozen foods, pharmaceutical drugs, chemicals, seafood, chemicals and fresh agricultural products. Cold chain commodities are liable to rot and perishable they are always directed to the destination or end user. Reducing customer complaints in an online grocery retailer is the theme of this paper. In addition, for cold warehouses and rooms in different cold chain facilities, the personal occupational safety risk assessment is established by considering the surrounding environment and the operators' personal health status.

Keywords: IoT, cold chain, temperature, humidity, risk monitoring, real time, foods

INTRODUCTION

Cold chain management has been growing in the past few decades. Unlike traditional supply chain management, the goods in cold chains, such as pharmaceutical products, chilled food and frozen food, generally a have shorter shelf life and higher sensitivity to the surrounding environment,i.e. temperature, humidity and lighting intensity. The proposed system consists of sensing module,
wireless communication technology, status prediction module and Android App module. An IOT resolution offers a powerful data-link platform with multi-sensor smart tracking devices, and highly innovative software applications, enabling us to monitor all cargo and containers across the globe in real time for maximum security, guaranteed quality and total visibility. Traditionally, supply chain transactions are completed manually, creating delays and a higher risk for recording error, which can cause differences between what was recorded and what was actually loaded. By digitizing this process using IOT, the relevant information is captured directly from the sensors placed around the products, and entered onto the platform, creating a single, shared repository that all authorized participants can access and which can only be altered with consensus from all parties.The embedded sensing devices are employed in IoT based systems to efficiently and economically gauge real- time environmental parameters in supply chain. While certain automations can be achieved through the use of IoT devices, the idea behind installing them in a supply chain is to gather the data necessary to achieve a less strenuous path from order made to a supplier, all the way to consumer. Employing a third-party provider like The Things Industries can significantly reduce the time it takes to deploy your solution. However, what you want to achieve specifically (e.g., temperature monitoring, real-time alerts, GPS tracking) is up to *your* supply chain and what *you* see as valuable. A company's supply chain stands to benefit from IoT innovations because they allow automating certain actions while preventing major incidents before they happen, and predicting consumer demand 6 to 12 months into the future without using traditional statistical model.

Smart Drainage Monitoring and Controlling System Using IoT and Machine Learning

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Abstract

The Government of India launched Smart Cities Mission on 2015. The objective of the smart cities mission is to create world class cities as per the aspirations and needs of the citizens. TUFIDCO is the mission Directorate for implementation of smart cities mission in Tamil Nadu. It improves the quality of life, efficiency of urban operations and meets the present and future generations with respect to economic, social and environmental aspects. For making our Erode as a smart city one needs to consider many parameters such as smart water, smart electricity, smart transportation etc. There will be a required of savvy underground foundation which incorporates underground water pipelines, communication cables, gas pipelines, electric stream, etc. As most of the cities in Tamil Nadu have embraced underground seepage framework, it is exceptionally vital that this framework ought to work in a legitimate way to keep the city clean, secure and sound. In the event that they fall flat to preserve the waste framework the unadulterated water may get sullied with seepage water and can spread irresistible maladies. So diverse kind of work has been done to distinguish, keep up and oversee these underground frameworks. Too, spills and bursts are unavoidable viewpoints of water dissemination framework administration and can account for noteworthy water misfortune inside dispersion organize on the off chances that cleared out undetected for long period. This work speaks to the execution and plan capacities for checking and overseeing underground seepage framework with diverse approaches. It too give a depiction of water astute framework and location strategy to detect.

Keywords: Alarm, Arduino, Blynk, GPS, GSM, IoT, , LCD, Node MCU Wi-Fi Module, Sensors.

I. Introduction

The underground drainage system is an important component of urban infrastructure. It is considered to be city's lifeline. Most management on underground drainage is manual therefore it is not efficient to have clean and working underground system also in such big cities, it is difficult for the government personnel to locate the exact manhole which is facing the problem. Most of the cities adopted the underground drainage system and it is the duty of managing station (Municipal Corporation) to maintain cleanliness of the cities. If the drainage maintenance is not proper the pure water gets contaminate with drainage water and infectious diseases may get spread. The drainage gets blocked during rainy season, it will create problem for routine life such as traffic may

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