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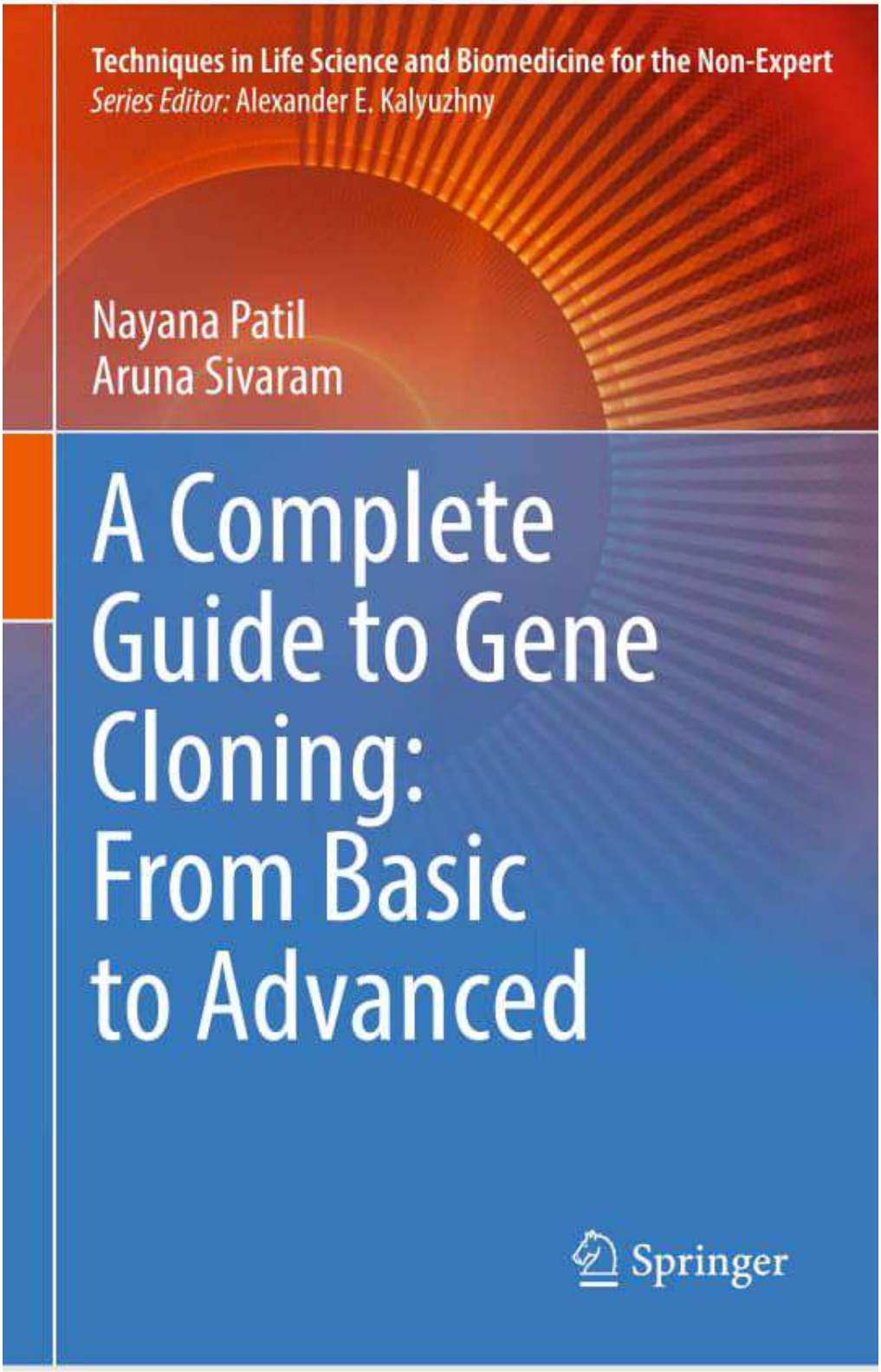

Techniques in Life Science and Biomedicine for the Non-Expert

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Sharanabasava V. Ganachari
Editors

Actinobacteria

Ecology, Diversity, Classification and Extensive Applications

Springer

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About the Editors

Jayachandra S. Yaradoddi is a Research Scientist in Biomaterials Laboratory, Dept. of Center for Materials Science, KLE Technological University, Hubballi, Karnataka, India. He obtained his Masters and Doctor of Philosophy of Biotechnology from the Gulbarga University, Kalburagi. He has executed research work on "diversity and molecular characterization of halophilic bacteria from Karnataka" during his Ph.D. He was served as a project fellow (JRF and SRF) under UGC major research project entitled "Siderophore as a biocontrol agent on phytopathogens of regional crops." Recently, he has completed post-doctoral studies on "Recent trends in actinobacterial diversity of environment and their potential bioactive molecules" from the University of Helsinki, Finland. He has published more than 40 publications in various national and international journals of repute and filed two Indian patents. He has completed the Govt. funded project under the IDEA2PoC scheme by Bangalore Bio innovation Center and KBITS, Govt. of Karnataka. His major thrust area of research is microbial taxonomy, biomaterials, industrial biotechnology, and bio-nanotechnology.

Oral Presentation: 1

Media Optimization Studies *of Chlorella sorokiniana* PCPBEC for Biofuels

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Abstract

Biofuels itself is an 'acheel's heel' and algal studies are still far away from commercial reach. Microalgae has a high potential in third generation biofuels. The major concern among microalgal research is unavailability of huge biomass required for commercial production. Green alga, species belonging to Chlorophyceae has more diversity and has a greater adaptation in wide climatic conditions. The current study aimed for biomass and lipid enhancement through media optimization studies. The experiment was divided into two phases of Response Surface Methodology in which placket – Burmann as phase-1 and Box-Behnken as phase 2. In PB experiment NaNO3, CaCl2, $MgSO_4$, KH_2PO_4, K_2HPO_4, Urea, and 2-4, D. Biomass had a better response for all the variables except Di-potassium orthophosphate. Further in Box Behnken experiment three variables NaNO3, CaCl2 and urea were chosen based on the results obtained from PB design. The results has revealed highest wet biomass which was obtained in Experiment number 1 [Concentration of $NaNO_3$ (High; +1), $CaCl_2$ (Central; 0) and Urea (Low: -1)] with biomass yield of 3.65 g/L on 14^{th} day of inoculation followed by experiment 2 [Concentration of $NaNO_3$ (Low: -1), $CaCl_2$(Central; 0) and Urea (Low: -1)] with yield of 3.45 g/L and lowest was in experiment 3 i.e., control [Concentration of $NaNO_3$ 50g/L,$CaCl_2$ 2.5 g/L and no Urea] with 2.28 g/L. Highest yield obtained in control was observed on $16\text{-}17^{th}$ day of inoculation where as in formulated media it was observed on $13\text{-}14^{th}$ day of inoculation. Two optimized media are being formulated for biomass and lipid enhancement. The isolate further may be used for biofuel studies.

Oral Presentation: 3

Statistical Optimization of Biodiesel Production from *Pongamia pinnata* Seed Oil Using Immobilized Lipase

Shilpa K Jigajinni& Dr. Bharati S Meti
Department of Biotechnology
Basaveshwar Engineering College (A) Bagalkot
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8722485018

Abstract

The environmental and economic aspect of fossil fuel use at greater extent encourages to find new alternative to fossil fuel which is ecofriendly and cost effective that could meet the growing energy demand. Biodiesel is Fatty acid alkyl esterone among the alternative renewable promising biofuel. The production of biodiesel through enzymatic transesterification is more advantageous than thermochemical process. Enzymatic process is influenced by many factors such as amount of biocatalyst, molar ratio of oil to alcohol, temperature, pH, rpm, time etc. Effective variables for transesterification may vary based on the type of feedstock and catalyst used, therefore it is essential to optimize the process suitable for each type of feedstock to achieve higher yield of biodiesel. Optimization through statistical way is more advantageous than traditional method. Reaction conditions of transesterification is optimized through Response Surface Methodology by Plackett-Burman and Box-Behnken design. The factors used in the present study for PB design are molar ratio, amount of immobilized lipase, temperature, time, pH, agitation speed and water content. The result showed that among seven variables, pH (*p-value* 0.003), agitation speed (*p-value* 0.024) and amount of immobilized lipase (*p-value* 0.041) having $p<0.05$ are statistically significant positively affecting the transesterification process of *Pongamia* seed oil. Further these effective variables are studied for optimization through Box-Behnken design. *p-value* developed for the model is found to be 0.007, indicating that the model is very adequate and highly significant at 95% confidence interval (*p-value* 0.05) approves the model for validation. The optimum parameters obtained by statistical designs such as concentration of biocatalyst (12.5%), pH (7), agitation speed (125rpm), molar ratio (1:3), temperature (45°C) and reaction time (24hr). Under optimum conditions, the model estimated biodiesel yield of 96% and experimental trial yields around of 94.8%. Fuel properties of biodiesel is tested as per ASTM standards.

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Lecture Notes on Data Engineering
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Intelligent Communication Technologies and Virtual Mobile Networks

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Abstract	The 5G wireless networks are expected to provide fastest mobile Internet connectivity, efficient network access, capable of handling large amount of data traffic, connecting large number of mobile devices with high-throughput and very-low latency. The new technologies such as cloud computing, network function virtualization (NFV), and software-defined networking (SDN) are being used in 5G wireless networks. The number of small cells in 5G networks creating a heterogeneous network environment (HetNet), where users will join and leave the network frequently causing repeated authenticated vertical handoff across the different cells leading to delay in the network. There are new security requirements and challenges in 5G mobile wireless network due to its advanced features. Therefore, in this paper to deal with secured vertical handoff, a trusted authenticating mechanism is proposed to secularly authenticate the user based on the credibility in 5G wireless networks. It is generating a trust relationship between user, base station, and home networks based on the user credibility and performs quick and secured handoff. The user credibility is comprises the direct credibility and indirect credibility calculation. Based on the user credibility, the trustworthiness of user equipment (UE) is identified and vertical handoff performed without re-authentication across different heterogeneous small cells in 5G wireless networks.

Keywords (separated by '-')	5G wireless networks - SDN - Trusted model - User credibility - Secure vertical handoff

User Credibility-Based Trust Model for 5G Wireless Networks

Shivanand V. Manjaragi and S. V. Saboji

Abstract The 5G wireless networks are expected to provide fastest mobile Internet connectivity, efficient network access, capable of handling large amount of data traffic, connecting large number of mobile devices with high-throughput and very-low latency. The new technologies such as cloud computing, network function virtualization (NFV), and software-defined networking (SDN) are being used in 5G wireless networks. The number of small cells in 5G networks creating a heterogeneous network environment (HetNet), where users will join and leave the network frequently causing repeated authenticated vertical handoff across the different cells leading to delay in the network. There are new security requirements and challenges in 5G mobile wireless network due to its advanced features. Therefore, in this paper to deal with secured vertical handoff, a trusted authenticating mechanism is proposed to secularly authenticate the user based on the credibility in 5G wireless networks. It is generating a trust relationship between user, base station, and home networks based on the user credibility and performs quick and secured handoff. The user credibility is comprises the direct credibility and indirect credibility calculation. Based on the user credibility, the trustworthiness of user equipment (UE) is identified and vertical handoff performed without re-authentication across different heterogeneous small cells in 5G wireless networks.

Keywords 5G wireless networks · SDN · Trusted model · User credibility · Secure vertical handoff

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Fault Analysis and Identification in Ubiquitous Networks using Cognitive Agents Approach

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***Abstract*—The ubiquitous network has set of heterogeneous networks such as wireless sensor networks, cellular networks, mobile adhoc networks, Bluetooth networks, etc. Each heterogeneous network communicates with other to perform ubiquitous computation, but there is a need of a fault tolerance mechanism. This kind of mechanism is used to provide continuous services to users in the presence of faults. The faults may be node, link, and memory level faults in the ubiquitous networks. Such levels faults are lead to the failure of the networks. However, there is a need for substantial time and sufficient resources for providing reliability in fault tolerance mechanisms. In this work, it has been proposed that cognitive agent based fault analysis and identification of types of faults using support vector machine algorithm. Also, the various types of cognitive agents are defined as network cognitive agents, heterogeneous node cognitive agents, gateway cognitive agents, ubiquitous cognitive agents, and fault analysis and identification cognitive agents. Each agent is communicating with other for analyzing the types of faults. Finally, the proposed work is simulated in terms of delay, probability analysis and identification, throughput, packet delivery ratio, and agent computation overhead.**

***Index Terms*—Ubiquitous Networks, Cognitive Agents, Fault identification, Fault Analysis, Support Vector Machine**

I. Introduction

Ubiquitous Networks (UNs) are used to access the services at anytime, anywhere, and at anyplace through the computing devices [1]. The dynamic and the uncertainty nature of ubiquitous network with resource constraints of the devices lead to deal with fault toleranceA system's fault tolerance is its ability to provide the desired level of functioning even when there are defects. The basic purpose of a fault tolerant system is to increase the availability and the reliability of the system. Fault tolerance should be seriously considered in many ubiquitous network systems since ubiquitous nodes are prone to failure. Each layer of the network system takes fault tolerance into account. More specifically, fault tolerance in a ubiquitous network may exist at hardware layer, software layer, network communication layer, and application layer.

There are several reasons for a communication link or a device/node to fail. The faults in any computing network can be categorized as device faults, application faults, network faults, and service faults. Device faults are considered as physical devices such as mobile devices, sensor nodes, and actuator failure. Each device has its own set of faults which contribute to failure of system. These devices will exist with limited battery power and signal strength because of which the system will not be able to execute an application. Anytime and anyplace service provider with its dynamic nature of nodes leads to networks faults like link failure and congestion problem. It gets disconnected with the ubiquitous computing environment makes the application to fail and sometimes there may be problem with service. Sometimes the system works correctly but gives incorrect result or operates incorrectly because of node failure.

Cognitive agent (CA) is a lightweight process that performs the tasks based on its knowledge regularly from the ubiquitous networks environment. CA independently executes the tasks in a flexible and intelligent manner. CAs are communicates, coordinate with other agents by its experience with changing environment and place [2]. CAs based fault tolerance in ubiquitous networks will handle the fault identification by deploying CAs at each layer of an environment to handle different types faults. Also, able to search available devices with resources either during or before data processing takes place and monitor the progress of information processing.

The CAs collects the information of users, nodes, links, available devices, and an environment for generating the beliefs. Develop the plan for the actions for achieving the goals (desires) of analysis and identification of faults using predictive analytics model that is Support Vector Machine (SVM). The desires of the beliefs are executed by the CAs in the ubiquitous networks that is the intention of the proposed CAs.SVM is a classification algorithm that classifies the types of faults in a ubiquitous network.The data is mapped from the input space vector to a higher-dimensional feature space vector using the mapping function. The high dimensional feature space and hyperplane in feature space are used to maximize the classification capability of SVM [3]. SVMs can be used to do nonlinear node classification by mapping the classified data to a high-dimensional feature space with the possibility of linear classification.

In this paper, the CA based fault analysis and identification using SVM approach is presented. Also, monitor the status of the nodes, links, and memory level of each ubiquitous node as a continuously by CAs. The classifications of the faults are done by using SVM classification algorithm. SVM

based classifier has better generalization property because it has principle of structural risk minimization.
The remainder of the study is organised as follows: Section 2 discusses current strategies for detecting problems in ubiquitous computing. The proposed technique of Cognitive Agents-based defect identification and analysis is demonstrated in Section 3. The simulation and results are presented in Section 4. Finally, in Section 5, the conclusion is offered.

II. Related Work

In this work, it has been carried out the related works towards proposed work that are as follows: The work given in [4] proposes a fault-tolerant anomaly detection method to improve and provide a solution to the problem where the event detection degrades when the probability of fault reaches a crucial value.The work given in [5]presents detection of defects in the Gas Station Internet of Things (GS-IoT) system and presents a bi-directional long-short term memory (BiLSTM) network algorithm combined with a support vector machine (SVM), SVM-BiLSTM. Work given in [6] described a bacterial-inspired technique for detecting unique mobile faults in wireless sensor networks (WSNs). Fault detection accuracy is considered as a parameter for analysis.The work given in [7] offers to integrate and detect hybridization between AI approaches and big data algorithms in order to improve building system monitoring and control, boosting comfort and lowering operating costs. A method has been proposed that uses AI and big data collected by building management systems to automatically detect irregular energy consumption (BMS).

The work given in [8] proposed an algorithm in which the checkpoint approach is used for executing recovery action in distributed system. The faulty node identified will be replaced and keeping the remaining part of network as it is and it handles hardware and software faults. Work given in [9]presents a data-based fault detection system for analyzing sensor node data and determining problems, preventing the related nodes from delivering data and reducing network damage. By collecting and analyzing data, the effectiveness of the suggested fault-detection model was tested on an integrated management platform based on the Internet of Things. The findings show that if a malfunctioning sensor node is not disconnected from the network, superfluous data transmission of other sensor nodes occurs as a result of ongoing abnormal data transmission, increasing energy consumption and shortening network lifetime. The work given in [10] proposes an analysis of failure propagation is used to offer a fault localization method based on sample programmes. When enough sample programmes are provided, even if the defective programme fails all test cases, the suggested methods of programme clustering and fault localisation working together can effectively find the suspicious statements, according to the experimental results. The work given in [11] proposed task based fault handling by saving the state of system periodically and restarting the job from its previously checked point instead of starting point by which the loss of information will be prevented.

The work given in [12] presented SVM grid approach for on line fault detection. Fine tuned prediction algorithm is used to get input parameter for increasing accuracy. Using the Markov State Transition Model, the work presented in [13] offered fault tolerance and QoS-based pervasive computing. A fuzzy logic approach for fault node detection with three inputs for an IOT system in presented in [14]. The parameters considered in this are false alarm rate and detection accuracy for performance analysis. The work given in [15] proposes a mechanism in WSNs for fault detection with low energy consumption distributed fault detection. It used the information collected by node will identify the fault by itself then uses neighboring node for data collection which reduces the traffic in communication. A method for detecting the attack on network by using SVM is described in [16].

III. Proposed Work

In this section, the proposed system architecture, computation of fault assessment value, and functioning scheme of the proposed scheme are discussed. The majorities of the existing techniques consider the status of nodes and have not applied intelligence techniques. In this work, for improving the efficiency of ubiquitous networks applying CAs. The major contributions of the paper includes: 1) the design of CA based SVM algorithm to fault analysis and identification. 2) Employing Belief-Desire-Intention (BDI) model using proposed CAs towards the faults of the network in terms of node or device, link, and memory level faults. 3) The usage of proposed CAs for delivering the network information for achieving the fault tolerance. 4) Evaluate the fault assessment value at each level of faults and 5) Finally, evaluated the proposed scheme in terms of performance parameters such delay, probability of fault analysis and identification, throughput, packet delivery ratio, and agent computation overhead.

A. System Architecture

The Figure 1 depicts the proposed system architecture. This architecture comprises various types of CAs like Network Cognitive Agents (NCAs), Heterogeneous Node Cognitive Agents (HNCAs), Base Station or Gateway Cognitive Agents (BSCA/GCAs), Ubiquitous Cognitive Agents (UCAs), and Fault Analysis and Identification Cognitive Agent (FAICA). The ubiquitous network associates with set of various heterogeneous networks like WSNs, Wi-Fi networks, Bluetooth networks, cellular networks, mobile Adhoc networks, etc., so each heterogeneous network associates with CAs. Also, each network associates comprises set of ubiquitous nodes. The descriptions of the proposed CAs are as follows:

- NCA – This agent is a type of mobile CA that monitors the network conditions in terms of node/device failure, link failure, node memory, and bandwidth of the network. This agent acts as an intelligent, autonomous, and proactive in the networks. It moves from one node to another node in the network to get the node information, bandwidth, and link information by contacting with HNCA

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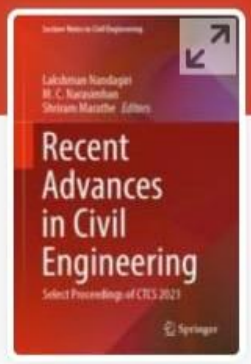

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Behavior of Fully and Partially Encased Stone Column in Black Cotton Soil

Mahantesh Neelawani ✉ & Prasanna Patil

Conference paper |
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Behavior of Fully and Partially Encased Stone Column in Black Cotton Soil

Mahantesh Neelawani and Prasanna Patil

Abstract In general, expansive soils are subjected to high volume changes as a consequence of variations in water content. In the dry season, these soils undergo shrinkage, which causes deep cracks in the soil. Thus, these soils are extremely troublesome for geotechnical engineers, so it is essential to implement the ground improvement techniques. The single-column behavior in expansive soil with and without encasement was discussed in this laboratory model study. The load tests were conducted in a steel tank measuring 50 cm × 50 cm × 50 cm. For the whole study, the column measures 30 mm in diameter and 300 mm in depth and is made of stone chips. The addition of a column increases ultimate strength by 225%. To enhance the strength and rigidity of the column, an encasement using non-woven geotextile was adopted. According to the load tests, a partially encased column improves ultimate strength by 275% and a fully encased column improves ultimate strength by 340%. A conventional column is associated with a lower load limit ratio, whereas a fully encased column is associated with a higher ratio. However, partially encased columns have a minor improvement. The behavior of a column in black cotton soil is influenced by climatic fluctuations, particularly at the 1D to 3D depths. Therefore, the encasement is adopted and lime was injected into the soil bed up to 150 mm deep to reduce the shrinking and swelling characteristics of the soil around the column.

Keywords Stone column · Non-woven geotextile · Black cotton soil · Fully and partial encasement

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Recent Trends in Computational Intelligence Enabled Research

Theoretical Foundations and Applications

Edited by
Siddhartha Bhattacharyya, Paramartha Dutta,
Debabrata Samanta, Anirban Mukherjee, Indrajit Pan

Contents

CHAPTER

2

Computational intelligence techniques for localization and clustering in wireless sensor networks

Basavaraj M. Angadi[1], *Mahabaleshwar S. Kakkasageri*[1] *and Sunilkumar S. Manvi*[2]

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2.1 Introduction

Wireless sensor networks (WSNs) are used to simplify and manage complex problems in most applications. Energy conservation in WSNs is a prime concern. It is important as the lifetime of the network depends mainly on the WSN energy consumption. Hence the highest priority is given to balancing and preserving the consumption of energy. Therefore the design and development of algorithms with minimum energy expenditure is a main challenge in WSNs. To achieve this, new protocols and schemes have to be designed using emerging computational techniques (Primeau, Falcon, Abielmona, & Petriu, 2018).

In a sensor network, it is very important to know about the location of the sensor node (SN) and data collected by that node which can be obtained using localization techniques. Accurate position estimation of target nodes in WSNs is highly desirable as it has a significant impact on the overall network performance. Normally, information regarding location is useful for deployment, coverage, location service, routing, target tracking, and rescue. In some industries, SNs are used to identify minute changes such as gas leaks, pressure, and temperature, and in military applications for the detection of landmines. Location information plays a key role in both of these cases.

In general, clustering means the process of grouping SNs into clusters to overcome the scalability problem. Clustering of SNs also helps in achieving high energy efficiency and extends the network lifetime, especially in large-scale WSN environments. It has been proved that for organizing a network into a connected hierarchy, clustering is an effective topology control approach (Angadi, Kakkasageri, & Kori, 2016). Hierarchical routing and data collection protocols include cluster-based organization of SNs for data fusion and aggregation purposes (Kakkasageri & Manvi, 2014), which leads to a substantial decrease in energy consumption.

Most computational intelligent technologies are interdisciplinary in nature, such as the integration of artificial intelligence (AI) with computer science and information systems with decision support systems. Some of the intelligent techniques include natural computation, bio-inspired computational techniques, game theory, AI, neural systems/networks, fuzzy logic techniques, genetic algorithms (GAs), intelligent multiagent systems, policy-based multiagent systems, machine learning, and so on (Alomari, Phillips, Aslam, & Comeau, 2018; Baranidharan & Santhi, 2016; Mann & Singh, 2017b; Singh, Khosla, & Kumar, 2018).

The chapter is organized as follows. Section 2.2 describes WSNs. Localization and clustering are explained in Section 2.3. Computational intelligence (CI) techniques for localization and clustering are discussed in Section 2.4, and finally, Section 2.5 presents further research challenges that need to be addressed.

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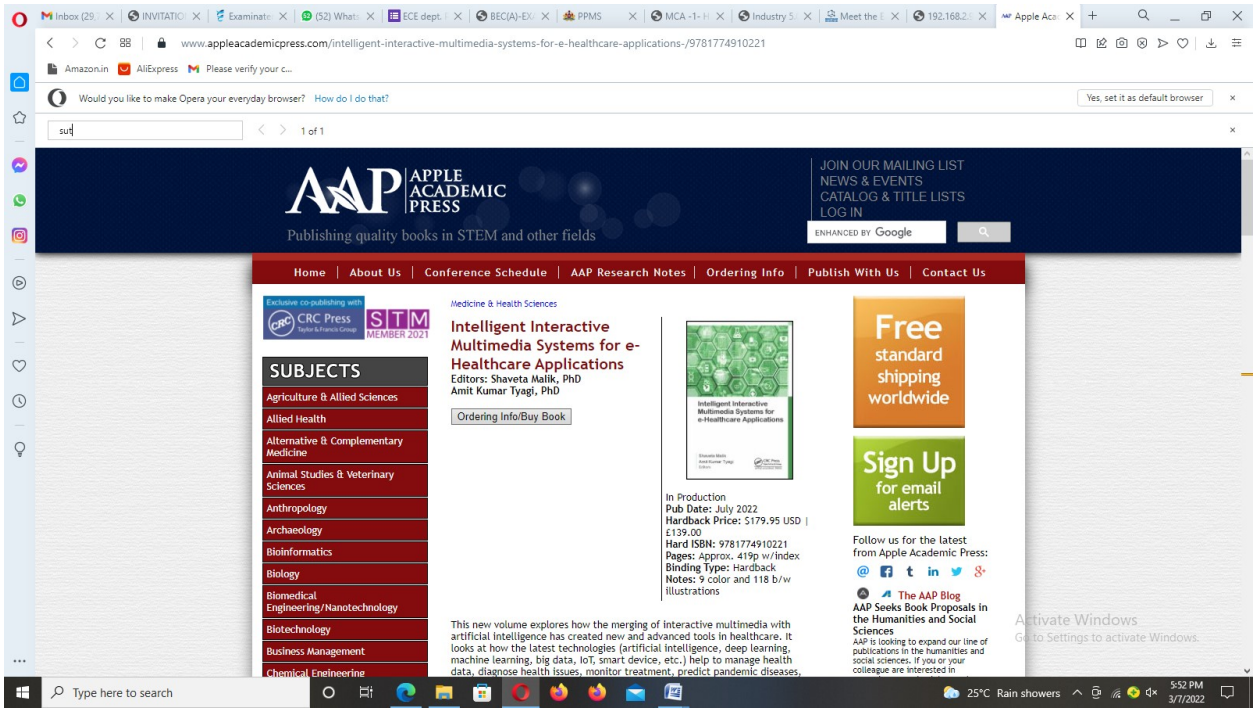
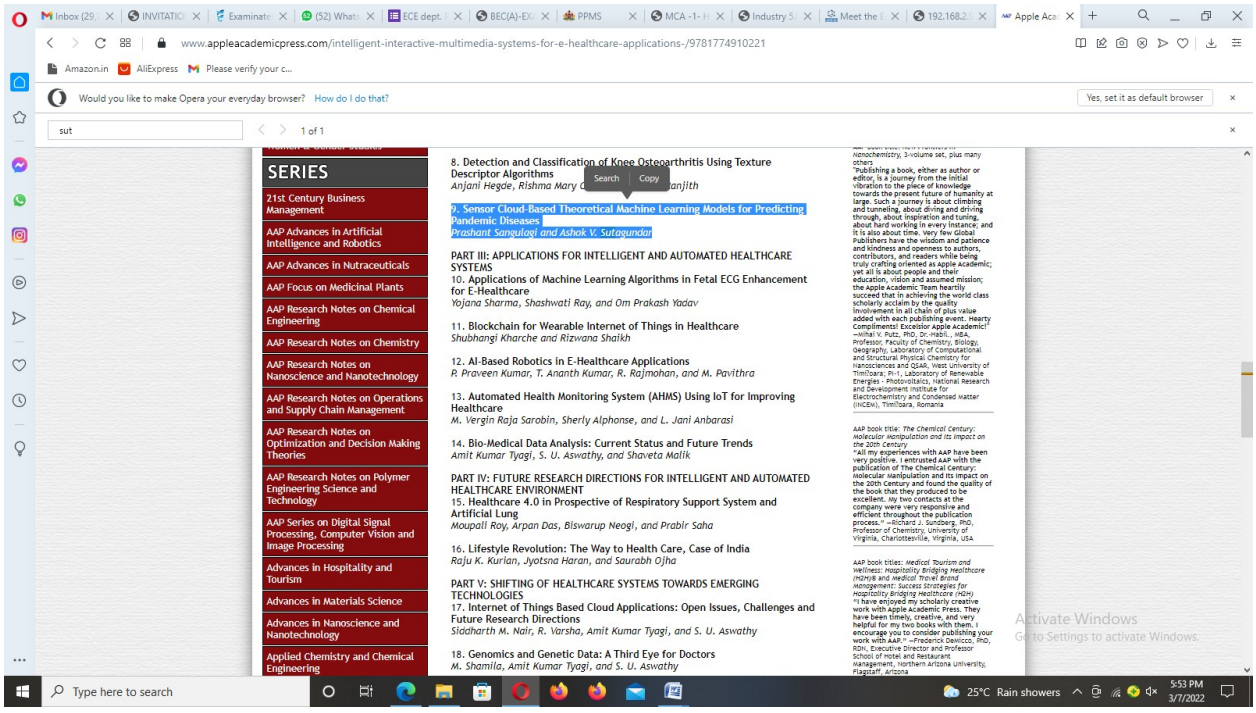
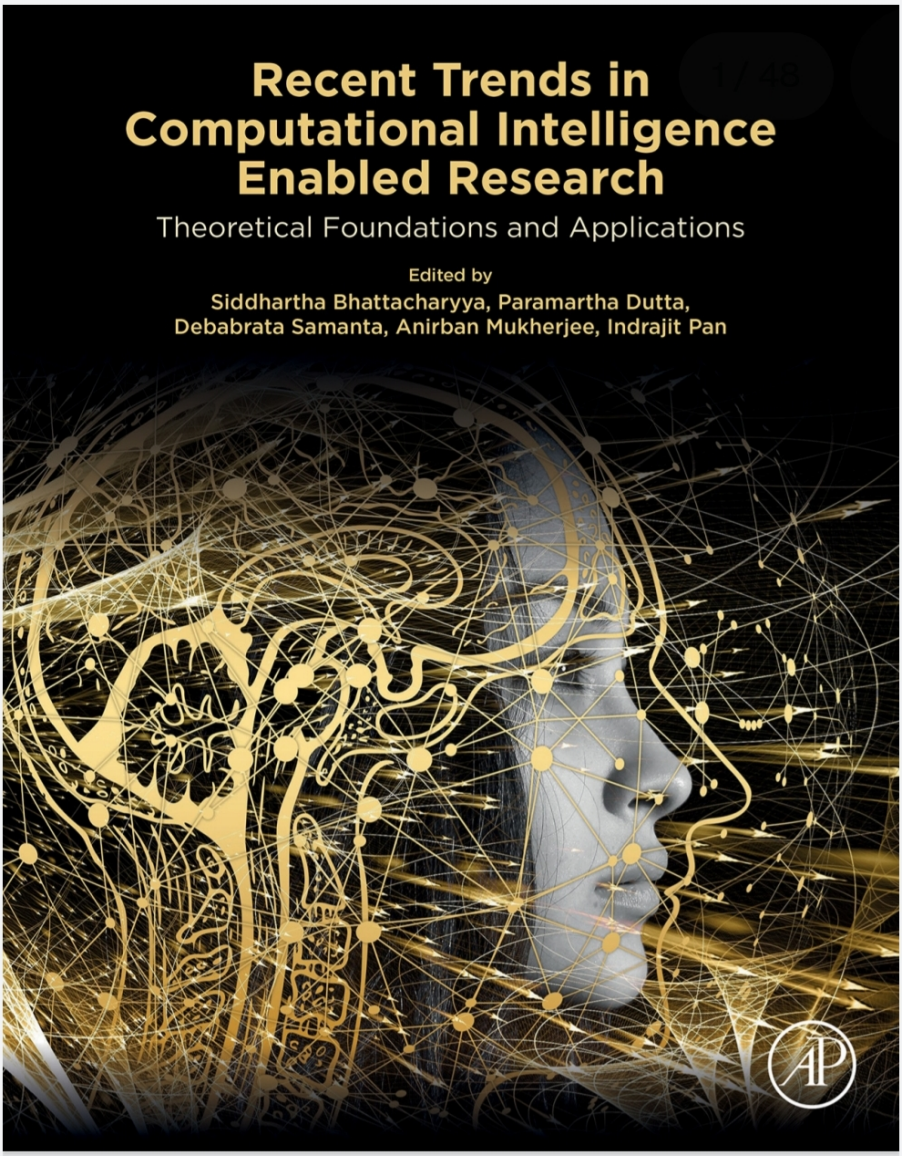




Theoretical machine learning models for predicting pandemic diseases in sensor cloud



RECENT TRENDS IN COMPUTATIONAL INTELLIGENCE ENABLED RESEARCH

Block Chain Interventions for Pharmaceutical Supply Chain Management: A Literature Survey

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Abstract : The patient care processes in hospitals are supported by a range of operational activities including inventory management and distribution of supplies to point of care locations. Hospitals carry large amounts and a great variety of items, and the issues of storing and distributing these items throughout the hospital supply chain are of great importance to providing high-quality patient service. Hence to provide more security to the supply chain system we proposed a model by integrating the blockchain with timestamp and location. To understand and improve the patient safety by combining the serious and nimble threats.

Key words: Block chain; Pharmaceutical supply chain: Barcode; Drug Transaction; Packet registry

Introduction:

The pharmaceutical supply chain is a system through which the prescribed medicines are manufactured and delivered to the patients, a wide range of stakeholders are involved in the chain including manufacturers, wholesale distributors ,.Supply chain management in the pharma sector can refresh the organization to make better use of resources to gives rise profits. to boost shareholders value , and positively respond to the customers demand , lack of effective supply chain management can cause problem for organization. Pharmaceutical supply chain should provide medicines in the right quantity with desired quality to the right place and customers, at the right time with optimum cost . and also it should make benefits for its stockholders .when supply chain partners are connected, it allows them to work together which provides end to end visibility and an opportunity to interact with other business. And the complexity of this system requires of large scope approach and collaborations. To increase the efficiency of the pharmaceutical supply chain we embed the block chain. it can enable more transparent and accurate end to end tracking in the supply chain and has the potential to solve the accurate issues of data storage and security transaction processing. As a decentralised shared ledger that requires cryptographic signatures for access and modification, block chain can create transparent, traceable system of recording transactions across the supply chain .

Security Issues :

1] Block chain technology in pharmaceutical industry to prevent counterfeit drugs

The proposed system is used to track the drugs from its manufacturing unit to patients , the effect of the drug on the patient has recorded to a database where only permissioned block chain is used. For implementation cryptographic alpha numeric key is used , but it has not given solution for security as counterfeit manufacturers uses reasonable brand logo .

2] A secure logistics model based on blockchain

The proposed secure logistic model analyses the security and efficiency of the model. a logistic block chain is build on decentralised and distributed platform using peer to peer network. python based Lbuntu Linux tool is used but it has not given overall security.

A Cloud Interfaced Social Ski Driver Optimized Routing for Future Electric Motor Vehicles

Shivanand C. Hiremath and Jayashree D. Mallapur

Abstract India is revamping towards building smart cities along with collaboration of information and communication technologies as a future mode of transportation and with a vision of adapting electric motor vehicles (EMVs) more than 90% to make electric vehicle nation by 2030. With scarcity and increased floating prices of combustion fuels, it has procured enormous intrigue among various researchers as the EMVs are termed as an upcoming incredible mode of transportation. In addition, EMVs protect environment by satisfying go-green initiative and it is vital to protect conventional fuels and use renewable sources. However, the EMVs have shorter driving ranges, which are limited by inadequate charge storage in batteries, EMVs are economical compared to using gasoline but due to irregularly distributed charging stations causing lack of interest and hindrance among people in adoption of EMVs. This paper presents unique strategy to assist EMVs users through optimum routing directions to charging stations with ease of access by using cloud hosted on VANET. The goal is to locate the shortest and with least traffic routes for charging EMVs through the cloud-based vehicular ad hoc network (VANET) model. Here, optimum routes for acquiring the nearest charging station find out using proposed social ski driver (SSD) algorithm and a comparative analysis is done with particle swarm optimization (PSO) algorithm by considering traffic density, battery power and distance parameters. The experimental result of proposed SSD algorithm outperforms the PSO.

Keywords Electric motor vehicle (EMVs) · SSD · PSO · VANET · CS

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ICT Systems and Sustainability pp 385-395 | Cite as

A Cloud Interfaced Social Ski Driver Optimized Routing for Future Electric Motor Vehicles

Authors Authors and affiliations

Shivanand C. Hiremath, Jayashree D. Mallapur

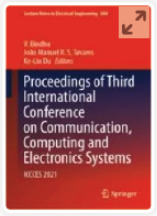
Conference paper

First Online: 01 January 2022

Part of the Lecture Notes in Networks and Systems book series (LNNS, volume 321)

Abstract

India is revamping towards building smart cities along with collaboration of information and communication technologies as a future mode of transportation and with a vision of



Proceedings of Third International Conference on Communication, Computing and Electronics Systems pp 777–791

Design, Simulation, and Development of DC-DC Converter for SPV-Powered DC Distribution System in Domestic Loads

Basanagouda F. Ronad

Conference paper | First Online: 20 March 2022

Part of the Lecture Notes in Electrical Engineering book series (LNEE,volume 844)

Abstract

Solar photovoltaic (SPV) systems together with DC microgrids are promising option for remotely located domestic loads, and this combination has many advantages over conventional AC distribution system. This paper presents design, simulation, and development of single input multiple output (SIMO) DC-DC converter for SPV-powered DC distribution system employed for domestic loads. Simulation model is built for DC-DC converter with 24 V input and resulting 12, 24, 32, and 48 V DC output voltages. Regularly used domestic loads which basically operate on DC voltages are considered for

Development of Smart Solar Tracker-An Approach towards Self Governed Tracking Mechanism

Publisher: IEEE

Adithya Bhuti ; Jyoti Kadakolmath ; Basanagouda F. Ronad All Authors

Abstract: This paper presents a novel smart dual axis solar tracker to optimize the energy consumption in tracking mechanism. In conventional approach high torque motors are employ... **View more**

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Abstract:
This paper presents a novel smart dual axis solar tracker to optimize the energy consumption in tracking mechanism. In conventional approach high torque motors are employed to continuously hold and mobilize the solar PV panels, which lead to excess energy consumption by motors, resulting in less efficient tracking systems. This issue is addressed by optimizing the panel rotation and detachment of motor shaft after directing the panel to sun's direction. The tracker includes two parts; main SPV plant of 60 W and miniaturized tracker with 10 W panels. LDR Sensors are located on miniaturized panel to track the sun's direction and this tracking mechanism of miniature model is utterly dependent on direction of irradiance only. Further, DC motor coupled to main SPV panels will rotate as per the signals of the miniaturized model and thus miniaturized model acts as decision making unit. Comparative analysis of results revealed that, performance of the system has increased by 15-35% at varying irradiance values.

Published in: 2021 5th International Conference on Electronics Communication and Aerospace Technology (ICECA)

Optimization of Hybrid Renewable Electric Energy System Components for Covid Hospitals

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Abstract:
This paper presents HOMER simulation models for optimizing renewable energy system components in Off grid and Grid connected systems for Covid-19 hospitals. Load profiles of 100 bed and 50 bed Covid hospitals are established critically. Two simulation models are built for each load profile. Optimization of energy system components is conducted based on net present cost and cost of energy. In process of optimization, HOMER simulates all possible configurations and ranks feasible combinations according to TNPC, and lists feasible options. Ten combinations are identified for analysis in each model. The critical analysis of results revealed that, grid connected system proves to be most economic and reliable option for hospital loads. The cost of energy obtained in grid connected system is Rs.9/kWh, whereas for diesel generated connected system costing Rs.22/kWh. This difference is appeared mainly due to higher cost of diesel and variation in the solar and wind energy potential with time of the day. Thus it is concluded that, renewable energy sources can be effectively employed for energizing the Covid-19 hospital in association with grid.

Published in: 2021 IEEE Mysore Sub Section International Conference (MysuruCon)

An Investigation on Torque Control Strategies for Switched Reluctance Motor

Publisher: IEEE

Basavaraju S. Hadapad ; Raghuram L. Naik All Authors

Abstract: The torque ripple is owing to inherent non-linear characteristics of switched reluctance motor (SRM). It leads to the noise and vibration that limits the adoption of SRM ... **View more**

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Abstract:
The torque ripple is owing to inherent non-linear characteristics of switched reluctance motor (SRM). It leads to the noise and vibration that limits the adoption of SRM in industrial and automotive applications. Numerous control strategies found in literature to cut down the torque ripple of SRM. This research focuses on an extensive survey on direct and indirect torque control algorithms. Direct torque control algorithms consists of direct instantaneous torque control (DITC) which is implemented with hysteresis and PWM based controller. While, indirect torque control is implemented by instantaneous torque control (ITC) and average torque control (ATC). It is observed from the survey that, in hysteresis based DITC, hysteresis band is designed to limit torque ripple which increases the switching losses due to high switching frequencies whereas, PWM based algorithms have constant switching frequencies but limited to low speed operating range. It also observed from study that, ITC is suitable for lower operating speed if back-EMF is less than dc link voltage and ATC is appropriate for complete operating speed range. Finally, critical comparison in terms of operating range, switching frequency, torque per ampere ratio and current control of these algorithms are presented. Outcome of

Direction Based Node Placement in Wireless Sensor Network

Publisher: IEEE

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Abstract:
This paper discusses a novel node placement strategy to be applied over the agriculture-based application in Wireless Sensor Network (WSN) emphasizing over the energy efficiencies and increased network lifetime. Most of the researches do not concentrate on node placement, which is first and critical parameter to estimate the performance of network. The paper discusses the problems associated with conventional random/grid deployment, motivation, research methodology, algorithm description. This paper finally discusses the comparative performance analysis of proposed system of relay node placement and energy modeling with existing node placement strategies in WSN. The simulation demonstrates that proposed system maintains a good balance between communication and energy efficiency.

Published in: 2021 International Conference on Artificial Intelligence and Smart Systems (ICAIS)

Date of Conference: 25-27 March 2021

INSPEC Accession Number: 20633472

Performance Assessment of SPV Powered DC Irrigation Pumps with Solar Tracking Mechanism

Publisher: IEEE

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Abstract: This paper presents the performance of SPV DC irrigation pumps with and without solar tracking mechanism. HOMER software is used for simulation. Simulation model is built... **View more**

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Abstract:
This paper presents the performance of SPV DC irrigation pumps with and without solar tracking mechanism. HOMER software is used for simulation. Simulation model is built for a 5 HP DC irrigation pump load. Local solar radiation data of Bagalkot, India are employed for the study. Developed HOMER model is standalone system with support of batteries. Constant DC load profile for seven hours/day is employed for the analysis. Further, simulations are carried out with different types of solar tracking mechanisms. SPV panel tracking with Monthly, Weekly, Daily & Continuous Adjustment of Horizontal Axis, Continuous Adjustment of Vertical Axis and Two Axis Adjustment are employed to attain the simulation results. For each tracking method, optimal configurations of SPV panels & batteries are listed and various costs corresponding to initial capital, operating, net present and cost of energy, capacity shortage & electricity generation details are tabulated. Comparative analysis amongst different types tracking is taken up. Results revealed that tracking of panels will enhance power production and in particular Two Axis Adjustment method will yield highest amongst all the tracking mechanisms.

Chapter 42
A Comprehensive Review of Access Control Mechanism Based on Attribute Based Encryption Scheme for Cloud Computing

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ABSTRACT

Cloud computing is the most prevailing paradigm, which provides computing resources and services over the Internet. Due to immense development in services provided by cloud computing, the trend to share large-scale and confidential data on cloud has been increased. Though cloud computing provides many benefits, ensuring security of the data stored in cloud is the biggest challenge. The security concern about the data becomes main barrier for adoption of cloud. One of the important security aspects is fine grained access control mechanism. The most widely used and efficient access control scheme for cloud computing is Attribute Based Encryption (ABE). The Attribute Based Encryption (ABE) scheme provides a new technique for embedding access policies cryptographically into encryption process. The article presents an overview of various existing attribute-based encryption schemes and traditional access control models. Also, the comparison of existing ABE schemes for cloud computing, on basis of various criteria is presented in the article.

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INTRODUCTION

In today's era, cloud computing has become an attracting technology, which has brought extreme changes to IT industry. Cloud Computing enables network access to various computing resources such as servers, storage, networks, applications and services. It is basically a paradigm that provides access to shared pool of resources online on demand (Armbrust et al., 2010). It is computing over internet. The users can store any amount of data on cloud and then can access it at any time, from anywhere. The most fascinating benefit of cloud computing is that it provides cost saving as the users will pay only for their usage. Cloud computing is also termed as distributed computing over a network. The term cloud can be defined as collection of servers delivering computing resources as a service on demand. Generally, the cloud comprises various interfaces, networks, hardware, storage devices etc. (Majumder et al., 2014).

Security is the biggest barrier for adoption of cloud computing. The data is present in shared environment, where other users can also access it. The users do not have complete control over the transit of data stored in cloud as both users and data are present in different domain. Hence the privacy concern arises for user's data and many users cannot completely trust the cloud environment. (KPMG, 2010; Hashizume et al., 2013, Tabassum et al., 2017). The security challenges can be faced at different levels such as architectural level, communication level and contractual and legal level (Ali et al., 2015). After adoption of cloud computing the organization cannot apply traditional security mechanism such as authentication, authorization in similar way as they exist. The reason is that the security requirements of organization with cloud environment are very much different than the traditional organization (Li and Ping, 2009).

Generally, in cloud environment users share their sensitive data with other users. In order to access the data, user must possess necessary permissions or credentials. Access control is a mechanism, which decides who can use a specific system, resource or application. It defines a way to allow, deny or restrict user access to system or its resources (Khan, 2012). Access control mechanism ensures that data must be accessed by authorized users only. In cloud environment, the owner of data and the data are present in different administrative domains. Thus, it is extremely important to ensure authorized access to data and manage user's identity. Due to the distributive and dynamic nature of cloud computing access control becomes very complex task. In traditional method the data is stored on some third-party server and access control mechanism is employed statically. However, this method does not guarantee the confidentiality of data because the server storing the data can be un-trusted entity. Therefore, providing better access control mechanism is a very important component of cloud security (Majumder et al., 2014). The main goal of access control is to restrict user to access what he/she should be able to do and prevent unauthorized access. The access control is defined as a mechanism to determine correct access to data by legitimate user depending on access privileges and permissions that are already defined in security policies (Younis et al., 2014). The major endeavor of this paper is to present brief overview of access control mechanisms used for cloud computing. Here, the classification of access control models applied for cloud computing that includes some traditional models and various Attribute Based Encryption schemes is elaborated.

The classification of access control models for cloud computing includes two categories as traditional models and the models based on cryptographic approaches. The taxonomy of access control models applied for cloud computing is depicted in Figure 1. The Discretionary Access Control (DAC), Mandatory Access Control (MAC) and Role based Access Control (RBAC) model come under traditional access control models.

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Isolation, Optimization and Molecular Characterization of Novel Lipase Producing *Lysinibacillus macroides* FS1 from Oil Rich Sample for Biodiesel Production.

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Corresponding author: skjbt@becbgk.edu 8722485018

Abstract

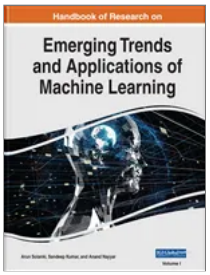
Lipase is one of the promising biocatalyst in field of Enzymatic Biodiesel production. Screening of lipase producing bacteria and its media optimization facilitates enhanced lipase production. Considering the advantages of enzymatic biodiesel production using lipases the objective of present work was to isolate lipase producing bacteria and its media optimization. Bacterial strain were isolated from oil rich sample showing maximum zone of hydrolysis on TBA Media was selected and identified as *Lysinibacillus macroides* FS1 by 16SrDNA gene sequence analysis. Lipase production was carried out in production media and lipase activity of 3.1U/ml was assayed by titrimetric method. Various media parameters were optimized and maximal lipase activity of 16.75U/ml were observed at 48 hr of incubation in optimized media with Honge oil as inducer, Galactose as carbon source , Ammonium Chloride and Beef extract as source of nitrogen, pH 7 and 37°C temperature with agitation speed of 120 rpm. Under optimized condition 5.4 fold increases in the lipase activity than innate activity was observed. 50.74% yield was observed with specific activity of 21.25U/mg after purification with 30% ammonium sulphate. Purified lipase was stable in presence of methanol at 37°C. Results obtained shows that Lipase from *Lysinibacillus macroides* FS1 was promising biocatalyst for Biodiesel production.

Keywords Isolation, *Lysinibacillus macroides* FS1, Lipase, Optimization, Biodiesel.

Introduction

Lipases (Triacylglycerol acyl hydrolases, E.C. 3.1.1.3) are group of hydrolases which catalyses the hydrolysis of triacylglycerol to release fatty acids and glycerol. Besides the hydrolytic reactions, lipases are able to catalyze many reactions like transesterification, interesterification, esterification, acidolysis, aminolysis, alcoholysis by using wide-range of substrates with high specificity (1,2). Lipase is believed to be very versatile biocatalyst and potential enzyme for the biotechnology industries becoming a target of several researches. Lipases are used in many different industrial applications, such as household detergent additive, textile industry, cosmetic industry, paper industry, pharma industry, synthesis of biopolymers and biodiesel, agrochemicals, flavor compounds and pharmaceutical compound synthesis etc (3,4).The study of the enzymatic synthesis of biodiesel was encouraged due to increasing pollution and by product separation problems of the chemical catalyzed process. (5).

More research focus is required to isolate industrial important lipase producing microorganisms from different habitats. Lipases are widely employed group of biocatalyst in different biological processes because of their broad substrate specificity and stereo selectivity in reaction (6).Lipases are produced from different species of plants, animals and microorganisms and they exist in different environments like compost heaps, decaying food, dairies, industrial wastes, oil-processing factories, oil seeds, soil contaminated with oil, waste water and petrol spilled soil (7, 8). The oil rich environment with organic substrates may furnish a suitable habitat for isolation of lipase producing bacteria (9). Lipase producers can be distinguished by showing a clear halo zone, turbid zone or white crystals around colonies of microbes on specific media such as Tributyrin agar(TBA), Phenol red agar, Tween20/80,Rhodamine B agar plates containing lipidic compounds like triolein, tributyrin, olive oil, tween 20, tween 80 etc. Microbial lipases occupied more industrial applications than plants and animal sources because of its hydrolytic and synthetic activities, high yield, ease in genetic manipulation, regular supply and easy cultivation of microbes on inexpensive media (10). Among microbial lipases bacterial lipases are more economical and stable (3). Most of the Bacterial species secretes lipase extracellular which are majorly affected by nutritional and physicochemical factors such as temperature, pH, nitrogen source and carbon source, inorganic salts, agitation and DO concentration (11,12,13,14).Media containing lipidic carbon, like edible and non-edible oils, fatty acids, glycerol or tweens in the presence of an organic nitrogen source facilitates the lipase production(15). Among many species some of them are efficient extracellular lipase producers mainly *Achromobacter, Alcaligenes, Arthrobacter, Pseudomonas*, *Staphylococcus, Chromobacterium, Bacillus* and *Pseudomonas spp*. (7). Few analyses have been shown the abilities of *Lysinibacillus* genera with several enzymatic activities including lipolytic, proteolytic, cellulolytic, pectinolytic and amylolytic activities (16). Solvent stable lipases are one of the promising biocatalysts in non-aqueous biological transformations hence focus need to isolate



Handbook of Research on Emerging Trends and Applications of Machine Learning

Arun Solanki (Gautam Buddha University, India), Sandeep Kumar (Amity University, Jaipur, India) and Anand Nayyar (Duy Tan University, Da Nang, Vietnam)

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Description & Coverage

Description:

As today's world continues to advance, Artificial Intelligence (AI) is a field that has become a staple of technological development and led to the advancement of numerous professional industries. An application within AI that has gained attention is machine learning. Machine learning uses statistical techniques and algorithms to give computer systems the ability to understand and its popularity has circulated through many trades. Understanding this technology and its countless implementations is pivotal for scientists and researchers across the world.

The **Handbook of Research on Emerging Trends and Applications of Machine Learning** provides a high-level understanding of various machine learning algorithms along with modern tools and techniques using Artificial Intelligence. In addition, this book explores the critical role that machine learning plays in a variety of professional fields including healthcare, business, and computer science. While highlighting topics including image processing, predictive analytics, and smart grid management, this book is ideally designed for developers, data scientists, business analysts, information architects, finance agents, healthcare professionals, researchers, retail traders, professors, and graduate students seeking current research on the benefits, implementations, and trends

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Due to the advent of Web 2.0, the size of social media content (SMC) is growing rapidly and likely to increase faster in the near future. Social...

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Chapter 24
Sentiment Analysis on Social Media:
Recent Trends in Machine Learning

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ABSTRACT

Due to the advent of Web 2.0, the size of social media content (SMC) is growing rapidly and likely to increase faster in the near future. Social media applications such as Instagram, Twitter, Facebook, etc. have become an integral part of our lives, as they prompt the people to give their opinions and share information around the world. Identifying emotions in SMC is important for many aspects of sentiment analysis (SA) and is a top-level agenda of many firms today. SA on social media (SASM) extends an organization's ability to capture and study public sentiments toward social events and activities in real time. This chapter studies recent advances in machine learning (ML) used for SMC analysis and its applications. The framework of SASM consists of several phases, such as data collection, pre-processing, feature representation, model building, and evaluation. This survey presents the basic elements of SASM and its utility. Furthermore, the study reports that ML has a significant contribution to SMC mining. Finally, the research highlights certain issues related to ML used for SMC.

OVERVIEW

In recent days, social media applications have emerged as leading mass media, as they allow users to work collaboratively and publish their content (Wadawadagi & Pagi, in press; Anami et al. 2014). Accordingly, large volumetric semantically rich information is being generated and accumulated every day in the form of tweets, posts, blogs, news, comments, reviews, etc. Investigating hidden but potentially useful patterns

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Advances in Intelligent Systems and Computing 1176

Vikrant Bhateja
Sheng-Lung Peng
Suresh Chandra Satapathy
Yu-Dong Zhang *Editors*

Evolution in Computational Intelligence

Frontiers in Intelligent Computing: Theory and Applications (FICTA 2020), Volume 1

Springer

Disaster Severity Analysis from Micro-Blog Texts Using Deep-NN

Ramesh Wadawadagi and Veerappa Pagi

Abstract The current decade has witnessed a significant amount of research in the field of sentiment analysis (SA). Several applications have emerged to evidence the necessity of research in this area. On the contrary, the size of micro-blogs content is overgrowing and likely to increase even faster shortly. Social media applications have become part and parcel of our daily lives, as they urge the public to express their opinions and share information around the world. Especially during disasters, people are likely to utilize social media to communicate their hindrances. In this article, we investigate the severity of disaster events from micro-blog messages posted by people during natural calamities and emergencies using deep learning techniques. In particular, the work employs a joint model that combines the features of convolutional neural networks (CNN) with recurrent neural networks (RNN), taking account of the coarse-grained local features generated via CNN and long-range dependencies learned through RNN for analysis of small text messages. Furthermore, the proposed model is evaluated for both binary and fine-grained analyses tested over two different datasets. The accuracy of 87% is observed for binary classification and up to 65% for a three-class problem. The intended work finds usefulness in many instants of disaster relief and crisis management.

Keywords Deep learning · Sentiment analysis · Convolutional neural networks · Recurrent neural networks

1 Introduction

Recently, micro-blog sites have emerged as leading mass media platform, as users are authorized to work collectively and publish their content [1]. Consequently, a large volumetric and semantically rich information is being generated and accumu-

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Identification of Intra-abdominal Organs Using Deep Learning Techniques

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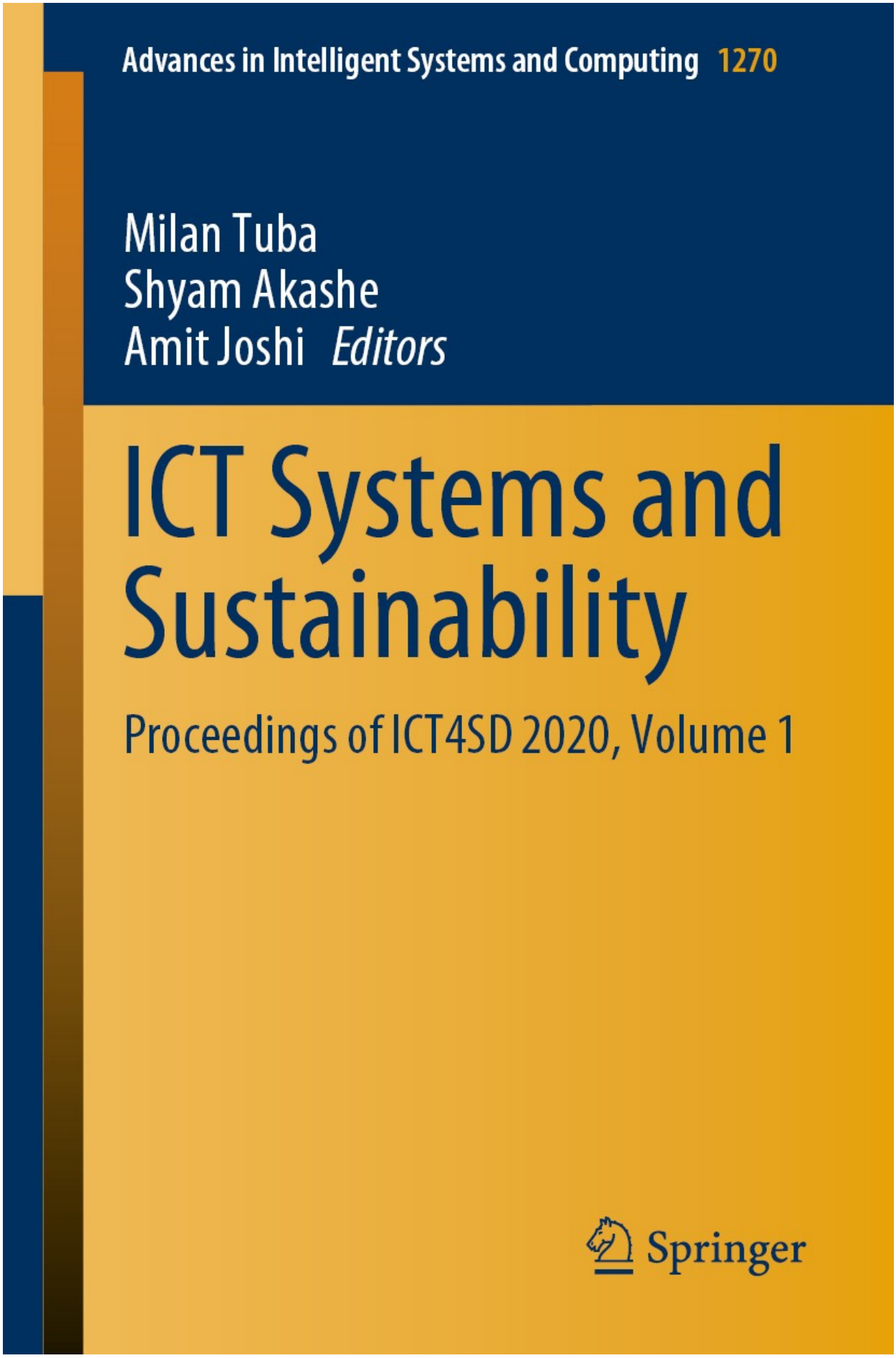
Abstract

Presently deep learning techniques are playing important role in making healthcare systems more intelligent, efficient, and effective. Proposed methodology is an advisory system in medical imaging which helps in clinical diagnosis. In medical imaging, ultrasound imaging is most frequently used as it is safe, painless, not exposed to ionizing radiation, and it allows real-time imaging. Ultrasound imaging takes more time in diagnosis and well-trained radiologist for interpreting and understanding. Hence, proposed system acts as an advisory system in identifying intra-abdominal organs and abnormalities if any. In this proposed system, the data was collected from intra-abdominal ultrasound images that do not contain any exploring information about the patient. Using filters, noise in ultrasound images is removed. Organ is segmented from ultrasound image and is identified by using deep neural network, and using shape and texture features, abnormalities are identified if any. At the end, various challenges that exist with deep neural network and ultrasound images are discussed.

AQ1

Keywords

Intra-abdominal organs
Deep learning
Ultrasound image
Feature extraction
Segmentation


Advances in Intelligent Systems and Computing 1270
Milan Tuba
Shyam Akashe
Amit Joshi Editors
ICT Systems and Sustainability
Proceedings of ICT4SD 2020, Volume 1
Springer

IoT Based Smart Farming Application For Sustainable Agriculture

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Abstract. The farmers are struggling to obtain higher rate of yield due to lack of poor knowledge about the soil and water nutrients and suitability of the crop for the soil. To overcome these issues and to promote Digital Agriculture concept we propose an IoT enabled sensor system for monitoring soil nutrient [NPK] and pH of irrigation water to reduce the manual laboratory method of testing and get the results via mobile application. Smart contract farming based mobile application will further process these nutrients value to predict and suggests the suitable crop to grow and the usage of appropriate amount of fertilizer to increase the soil fertility. The mobile application also helps in establishing the connection between farmers and Agricultural Produce Market Committee (APMC) in order to avoid fragmentation of profit shares and attain Pricing uncertainty and marketing of the yields by avoiding the middle man. APMC is a state government body which ensures safeguard to the farmers from exploitation by large retailers. Thus, the proposed work helps the farmers in adopting stress-free farming practice by signing the contract offered from APMC to select the suitable crop for their agriculture land, dispensing the required amount of fertilizer to the soil based on soil and water nutrients analysis using IoT enabled sensor, funding/insurance to the crops in case of occurrence of unpredictable natural disaster in future and direct marketing facility without middle man.

Keywords: Sustainable agriculture, Smart contract farming, Soil and Water Nutrients, IoT, APMC, Crop insurance.

1 INTRODUCTION

India is a country where agriculture is given a lot of importance as it is the backbone of the Indian economy. It provides employment opportunity to more than half of the workforce of the country and also contributes 16.5% to total gross domestic product (GDP), and also. Earlier days there was no scarcity for food and water as it was used in efficient manner. But now a day there is scarcity of food and water due to increase in population growth of the country. To satisfy their needs fertilizers are used to increase crop production. Fertilizer is any substance which is added to soil for supplying nutrients externally which are crucial to plant growth. Too much use of fertilizers shatters the growth of crops and little usage will result in less yield therefore it is necessary for farmers to understand the correct usage of fertilizer to increase the soil fertility.

Nutrients are important factors for plant growth and are divided into micro and macro nutrients. Totally soil consists sixteen nutrients among them the three primary nutrients

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Contents

Multi-class Support Vector Machine-Based Household Object Recognition System Using Features Supported by Point Cloud Library

Smita Gour, Pushpa B. Patil, and Basavaraj S. Malapur

Abstract The proposed system aims to design and develop an object recognition system with the help of the Point Cloud Library (PCL). The object recognition problem is addressed with a three-stage mechanism. In the initial stage using PCL, the object image undergoes segmentation methods which make the image suitable for extracting the features. In the second stage, a segmented image is used to extract suitable shape-based features that can separate each object type. The last stage involves the classification/recognition of the object of the particular type using support vector machine (SVM). The system reached the expected results using Point Cloud Library (PCL) and support vector machine (SVM) as a classifier. The system has given 94% accuracy for 10 different household object types. Ten samples for each object type are used for training the SVM, and to perform testing, complete different five samples from training samples are considered.

Keywords Object recognition · Point cloud library · Support vector machine

1 Introduction

Object recognition is a major research area in the field of computer vision since the appearance of objects is different in its size, shape, etc. due to the varying distance between the camera and the object. Also, there is a drastic change in its visual parameters due to the use of different sources of illumination and capturing conditions during image acquisition. The main goal of the object recognition system is to make

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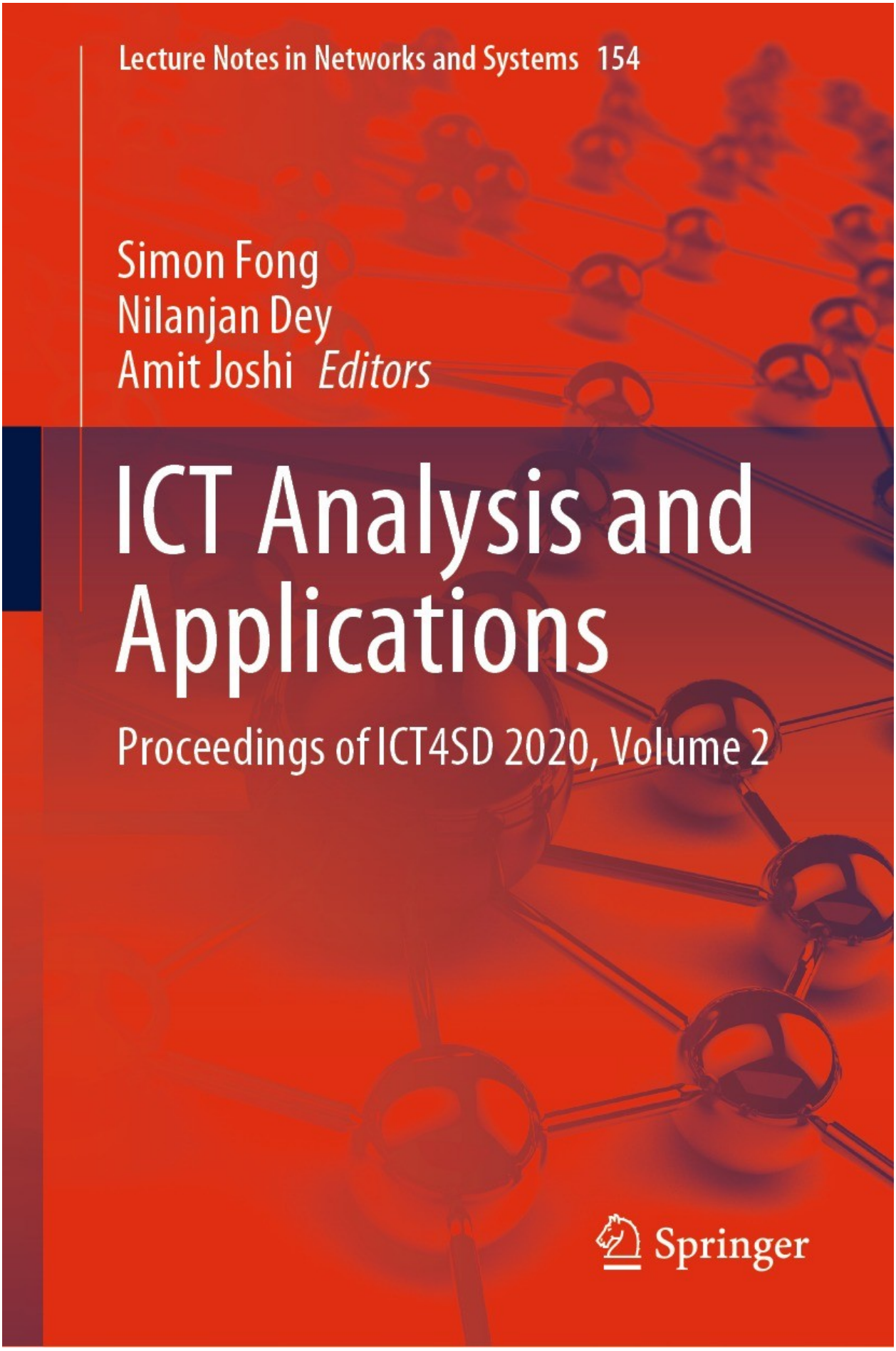
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CHAPTER

Clinical diagnostic systems based on machine learning and deep learning

8

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8.1 Introduction

Revolutions in technology, including Internet applications, embedded systems, the Internet of Things (IoT), and others have made medical services easier with handheld devices. Many mobile healthcare applications are becoming the essential services of mankind. A healthcare system offers wellness programs in order to provide a healthy life to all people. A healthcare system is the organization of people, institutions, and resources for improving or maintaining health by preventing, diagnosing, and treating as well as helping in recovery from disease, illness, and physical and mental impairments. Advancement of health wards that is well-being for the people, openness to the hopes of the residents, reasonable means of finance procedures are depends on four important functions such as giving wellness programs, generation of resources, invest in, and stewardship. Healthcare is envisaged for institutions and individuals. An individual means health specialists and associated health works, working as an employee in hospital, clinic, or other healthcare institutes, or they can be freelancing. Nowadays, there have been huge technical improvements in computational power, fast data storage, and parallelization. These improvements allow machine learning (ML) and deep learning (DL) technologies to be used effectively and efficiently in healthcare systems. Since 2016, a significant amount of investment in artificial intelligence (AI) research has been done in healthcare applications as compared with other sectors. ML and DL help clinicians in early detection, identification, and treatment of diseases as well as the prediction and prognosis of a particular disease. In healthcare systems, ML and DL techniques are used significantly in medical imaging, electronic health records (EHR), genomics, treatment design, consultation using digital media, simulated nurses, management of medication, drug creation, monitoring health, analyses of healthcare systems, sensing, and the online communication of health. ML and DL techniques offer efficient and effective systems for medical diagnosis. Clinical diagnosis is the method of determining the disease or the state that defines symptoms and signs. Various diagnostic procedures are employed in diagnosis, including analysis at the cellular and chemical levels,

Demystifying Big Data, Machine Learning, and Deep Learning for Healthcare Analytics.
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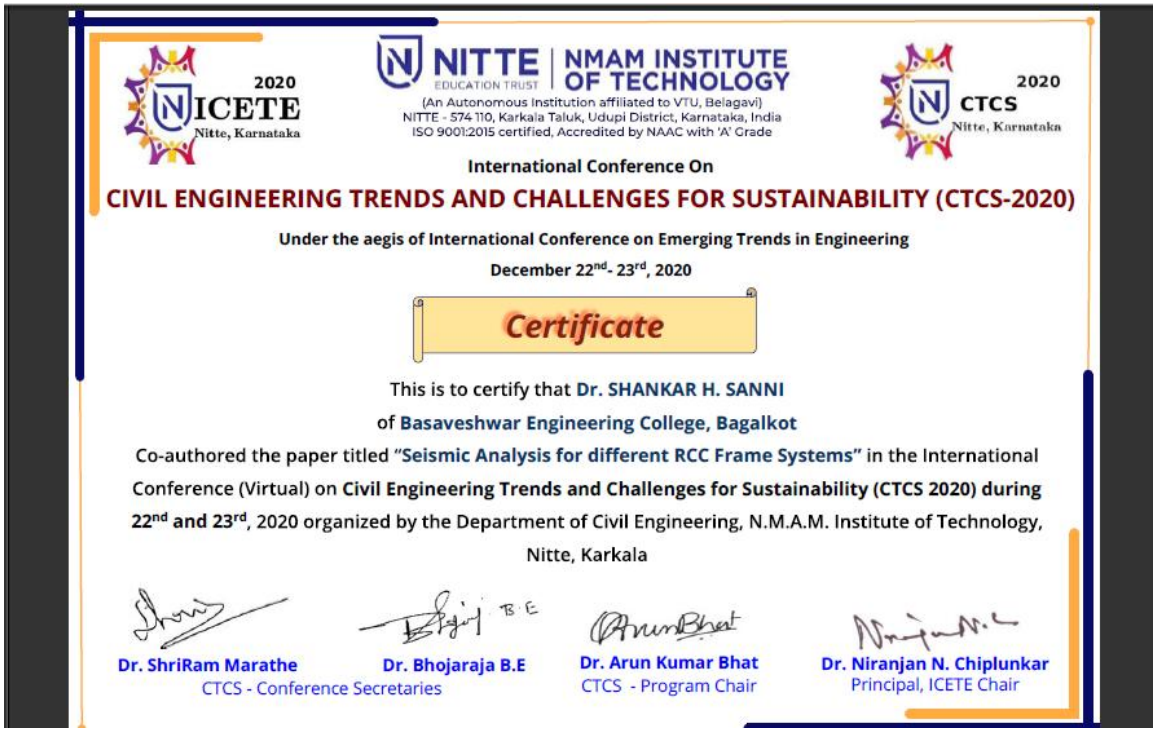

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Experimental Investigation of M-Sand in Concrete

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ABSTRACT
The natural river sand was the cheapest resource of sand. However the excessive mining of river bed to meet the increasing demand for sand in construction industry has led to the ecological imbalance in the country. Now the sand available in the river bed is very course and contains very high percentage of silt and clay. The silt and clay present in the sand reduce the strength of the concrete and holds dampness. A few alternatives have come up for the industry to bank on of which manufactured sand or M-sand (manufactured sand), as it is called, is found to be the most suitable one to replace river sand. M-sand has caught the attention of the construction industry and environmentalists alike for its quality and the minimum damages it causes to nature. Usage of M-Sand can drastically reduce the cost since like river sand, it does not contain impurities and wastages is nil since it is made with modern technology and machinery. Once them-sand becomes more popular in the construction industry, the demand for river sand and illegal sand-mining would come down. M-sand that is available is graded, sieved and washed. The particles are more rounded and granular and do not have sharp edges. Usage of M-Sand can overcome the defects occurring in concrete such as segregation, voids, capillary, etc. The main purpose of this investigation is to replace sand in concrete with M-Sand for both M-30 and M-40 grades. The test results were compared to that of conventional concrete for 7 days and 28 days. Thus from result it is concluded that m-sand can be effectively used instead of river sand in concrete.

Keywords : M-Sand, Compressive strength, Split tensile strength and Flexural Strength

Biodegradation of Organic Fraction of Municipal Solid Waste (Leaf litter) under Aerobic Conditions

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Abstract:

The objective of this study was to determine the extent of biodegradation of the most common organic fraction of MSW, i.e., leaf litter. A batch biodegradation study was conducted with leaf litter for 180 days under aerobic conditions. Three sets of samples were monitored and included biologically active samples (S), autoclaved controls (C) and sodium azide (a biocide) controls (SAC). Removals of TSS for S, SAC, and C samples were 70.65%, 22.4%, and 17.65 %, respectively and removals ofVSS were 63.1%, 24.29%, and 21.52%, respectively. Dissolved Oxygen (DO) concentrations recorded were between 7.12 mg/L to 4.38 mg/L indicating aerobic conditions. Greatest reductions in TSS and VSS were observed in the biotic samples while some reductions were observed in both control sets. These results indicate that biodegradation was responsible for most of the reduction in TSS and VSS concentrations in biotic samples while reductions in controls sets were due mainly to abiotic processes.

Speech Intelligibility Improvement based on Noise Reduction and Frequency Compression Technique

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Abstract A combined structure of noise reduction and multi band frequency compression (MFC) technique has been developed to compensate for the spectral masking effect in people with sensorineural hearing impairment. Increased spectral masking reduces the speech intelligibility that affects the speech perception especially under adverse listening conditions. Noise reduction techniques namely wiener filter and spectral subtraction methods have been used in the combined structure to reduce background noise. To quantify the intelligibility of perceived speech, listening test using Modified Rhyme Test (MRT) was conducted for normal hearing and hearing impaired persons in the presence of additive noise. Test material consists of 300 words. Each word starts with phrase "would you write-------". Results of MRT, when processed by cascading wiener filter with a MFC scheme, for the compression factor of 0.6 conducted on hearing-impaired subjects suggest improvement in speech intelligibility of 25.92%, to 30.134 % and decrease in response times of 0.815 to 1.626 seconds for SNR values of + 6 dB to - 6 dB in periods of + 3 dB respectively. For spectral subtraction technique when cascaded with MFC scheme, an improvement in speech intelligibility of 20.22 % to 25.804 % and decrease in response times of 0.452 to 0.995 seconds for SNR values of + 6 dB to - 6 dB in periods of + 3 dB respectively. The results of this study showed an improvement in speech intelligibility and a reduction in the load of perception.

Keywords Sensorineural Hearing Impairment; Spectral Masking; MFC; Wiener Filter; Spectral Subtraction Technique; MRT

I. INTRODUCTION

Sensorineural Hearing impaired persons have broader auditory filters [1] [2]. Hearing disabled people have trouble understanding speech because the wider auditory filters are very flat. The intelligibility of speech is decreased because of background noise. Hence, under complex acoustic conditions, Sensorineural Hearing impaired persons have problem in understanding speech. Therefore Noise reduction techniques along with signal processing methods are essential in hearing aids for improving the speech perception.

The noise minimizing methods boost required speech signal in noisy environments so as to get the listening comfort by increasing SNR.

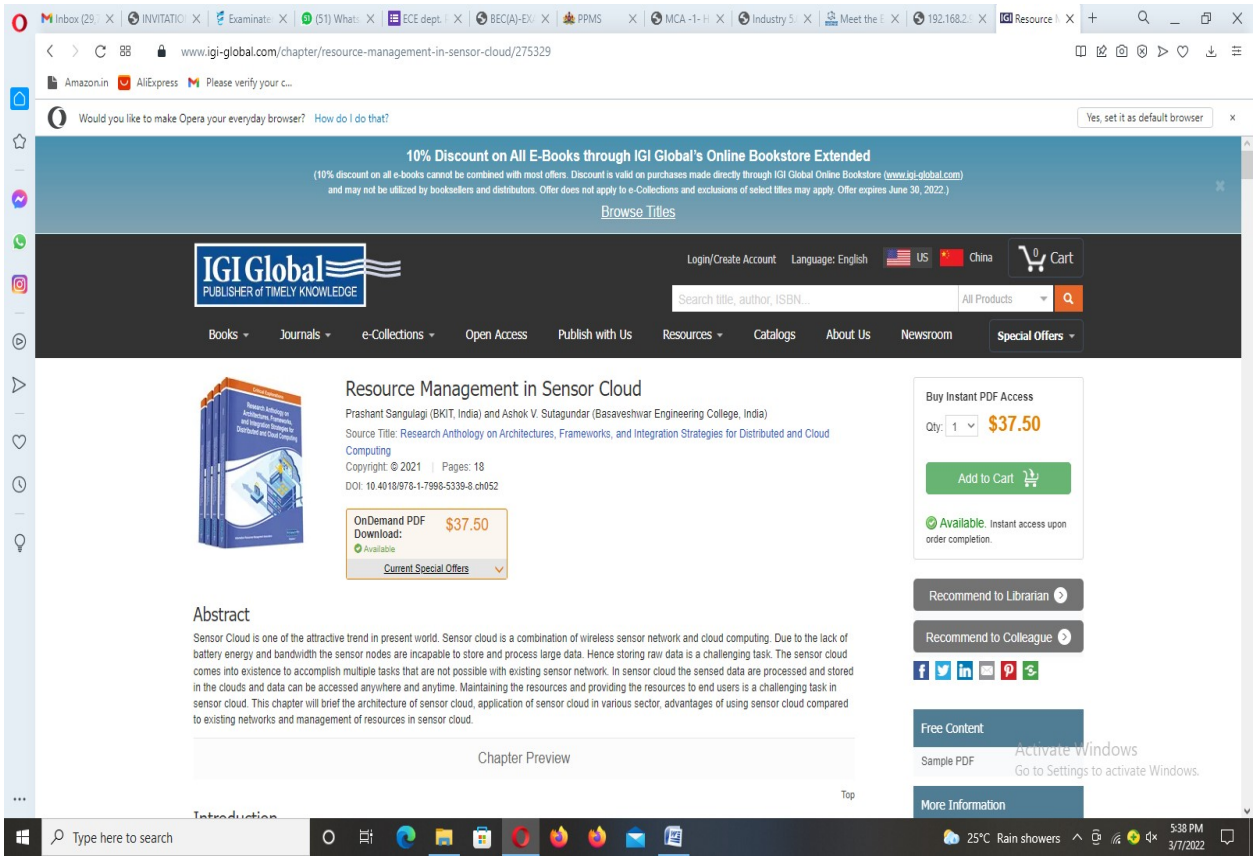
It is crucial for hearing devices to include both noise reduction and frequency compression techniques to improve speech perception, but usually these techniques are developed and tested independently of each other.

Hence the current study is to evaluate the usefulness of combined configuration of de-noising and MFC in improving auditory processing in monaural hearing aids. We have tested different de-noising techniques (spectral subtraction and wiener filter) cascaded with MFC technique. Comparisons of the methods w.r.t improvement in intelligibility of the output speech were carried out by means of a modified rhyme test (MRT). Section II describes the related research, the proposed work is discussed in Section III, Listening tests using MRT are given in Section IV and the results are analyzed in Section V, the spectrographic analysis is done in Section VI and finally, Section VII ends with potential future work.

II. RELATED WORKS

Deafness is most common at higher frequencies. Existing hearing devices do not offer any advantage for high-frequency sounds and consequently limit perceivability of sounds, mostly for profoundly hard of hearing people [3]. Transposition methods are used to transfer speech signal samples identification of speech in silent and in noise for children with from higher to lower frequency range using a fixed compression factor [4] [5]. Effect of nonlinear frequency compression (NLFC) on hearing loss was evaluated [6]. The filter bank summation approach (FBS) is researched for dichotic listening with frequency compression to reduce spectrum masking [7]. A cascaded noise reduction and time-splitting method using half cosine fading function for speech signals is explained [8]. For modest sensorineural hearing loss, spectral splitting with a wiener filter for correcting the effects of spectral masking is described. [9] [10]. Frequency compression along with noise minimizing method to enhance speech perception is addressed [11].

Single channel noise reduction techniques make use of variations in spectral and temporal features of speech and noise sources. In past, many single-channel noise reducing methods have been investigated. Spectral Subtraction (SS) [12] is the most often used technique, which involves subtraction of distorted power spectrum from auditory power spectrum to get enhanced speech. The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Abstract
Sensor Cloud is one of the attractive trend in present world. Sensor cloud is a combination of wireless sensor network and cloud computing. Due to the lack of battery energy and bandwidth the sensor nodes are incapable to store and process large data. Hence storing raw data is a challenging task. The sensor cloud comes into existence to accomplish multiple tasks that are not possible with existing sensor network. In sensor cloud the sensed data are processed and stored in the clouds and data can be accessed anywhere and anytime. Maintaining the resources and providing the resources to end users is a challenging task in sensor cloud. This chapter will brief the architecture of sensor cloud, application of sensor cloud in various sector, advantages of using sensor cloud compared to existing networks and management of resources in sensor cloud.
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Industry 4.0, AI, and Data Science

Research Trends and Challenges

Edited by
Vikram Bali, Kakoli Banerjee, Narendra Kumar, Sanjay Gour,
and Sunil Kumar Chawla

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Chapter

Artificial Intelligence Techniques Based Routing Protocols in VANETs

A Review

By Mamata J. Sataraddi, Mahabaleshwar S. Kakkasageri, Sunil kumar S. Manvi

Book Industry 4.0, AI, and Data Science

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Pages	26
eBook ISBN	9781003097181

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ABSTRACT

Vehicle Ad Hoc Network (VANET) is a type of wireless network consisting of vehicles and roadside communication devices. As VANET is associated with life-critical applications, it is important to consider each component of VANET design, functionality, software, and problems before introducing them. The important goal of VANET is to offer seamless communication for people traveling on the road to collect and relay message from every nearby vehicles in the event of urgent situations such as severe traffic jams, collisions, lane shift, speed limit, hazard or road condition alerts, position alert services, and in the event of climatic disasters, etc. Due to the high mobility of the vehicles, frequent network disconnection happens and many problems emerge in VANETs such as routing, synchronization, network congestion, network control, information management, privacy, security, etc. This chapter reviews the current state of the research on recent artificial intelligence techniques based VANET routing. The chapter also addresses on-going research works on the usage of artificial intelligence techniques for routing in VANET and future challenges need to be addressed in providing the artificial intelligence techniques for routing in VANETs.

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Acceptance Letter

Mr/Mrs **Kirankumar Y. Bendigeri, Jayashree D. Mallapur, Santosh B. Kumbalavati**

Herewith, the conference committee of the "2ND International Conference on Innovative Data Communication Technologies and Application (ICIDCA 2020)" is pleased to inform you that the peer-reviewed research paper "**PaperID**: **ICIDCA023 Real Time Monitoring of Crop in Agriculture using Wireless Sensor Networks**" has been accepted for oral presentation and publication at ICIDCA 2020 Organized by RVS College of Engineering and Technology, to be held during September 03-04, 2020 at Hotel Arcadia, Coimbatore, India.

ICIDCA 2020 is an interdisciplinary forum for researchers from all over the globe to share and exchange their valuable research insights on emerging intelligent data communication practices concerning the future of communication technologies domain. ICIDCA 2020 encourages only the active participation of highly qualified delegates to share and exchange various innovative research ideas, where all the accepted and registered research manuscripts will be solely dedicated for publication in Springer Lecture Notes in Data Engineering and Communication Technologies.

We congratulate you on being successfully selected for the presentation of your research work at our esteemed conference

Regards

Dr. S. Smys
Organizing Secretary
ICIDCA 2020

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Our Previous Publication
2019 Publication Link

Technical Comments

International Conference on
Intelligent Data Communication Technologies and Internet of Things (ICICI 2020)
27-28, August 2020 | JCT College of Engineering & Technology, Coimbatore, India

Paper ID : ICICI010
Paper Title : Wireless Sensor Networks and its application for Agriculture

Review Comments 1:

TECHNICAL COMMENTS
1. The algorithms to be explained with pseudo-code/flowchart.
2. Only one sensor/node is shown in photograph. The node is also seen connected to laptop via a cable. With this in place, how do the authors claim that routing algorithms have been used as routing algorithms require a minimum of 5-7 nodes?
3. The title and results are confusing.
4. Were any fault detection or any other parameters analysed?
5. Screenshots of measurements in laptop to be included.
6. Few qualitative results to be tabulated with explanations.
7. Cite the following papers in reference:
i). Kumar, A. Dinesh, and S. Smys. "An energy efficient and secure data forwarding scheme for wireless body sensor network." International Journal of Networking and Virtual Organisations 21, no. 2 (2019): 163-186.
(ii). Mugunthan, S. R. (2019),"Security And Privacy Preserving Of Sensor Data Localization Based On Internet Of Things", Journal of ISMAC, 1(02) 81-92.
GENERAL COMMENTS
8. Check English grammar and Springer Journal Paper formatting.
9. Use equation editor. All equations must be continuously numbered.
10. All figures must be titled and correctly numbered.
11. Use higher resolution images. Give citation for all images.
12. Avoid first and third person pronouns.

Paper

Location Estimation of Nodes in Underwater Acoustic Sensor Networks

B. S. Halakarnimath and A. V. Sutagundar

[1] *Research Scholar of VTU, Department of Computer Science and Engineering, S.G. Balekundri Institute of Technology, Belagavi, Karnataka, India*

[2] *Department of Electronics and Communication, Basaveshwar Engineering College, Bagalkot, Karnataka, India*

https://doi.org/10.26636/jtit.2021.145720

Abstract—The paper presents a location estimation scheme for underwater acoustic sensor networks. During the first phase, the sink node begins the trapezoid formation process by activating the trapezoid formation agent. It stores relevant information in the sink's knowledge base and in the node's knowledge base, and also develops the search data structure required for locating the node. During the second phase, the position of the node is determined by utilizing the search data structure. Identification of the location of all nodes by traveling across the trajectory may be performed as well, as an alternative approach. When identifying the location of one node, the estimation is performed based on the search data structure. When determining the position of all nodes, the sink node agent travels along the defined trajectory and transmits beacon messages which contain the real-time location at specific points. The anchor node agent measures the signal strength and localizes itself and begins estimating the locations of other nodes within the trapezoids, using location estimation techniques. Various performance parameters are used to validate the proposed scheme.

Keywords—location estimation, trapezoid, UASN.

1. Introduction

Location estimation for large scale mobile underwater acoustic sensor networks (UASNs) is intriguing because of harsh aqueous environments. Even though acoustic methods are suitable for underwater communication, such features as moderate bandwidth and considerable failure rate impose specific constraints on location estimation schemes [1]. Propagation delays, movement-caused Doppler shifts, amplitude and phase fluctuations, and multipath obstruction are all factors that need to be taken into consideration in location determination procedures. Some of the localization-related issues are presented below [2]:

- need for a proper sound-speed variation model used for location estimation,
- immersed sensor nodes need precise time synchronization,
- efficient node mobility pattern for dynamic underwater conditions,
- impacts related to medium access control (MAC), including contention fixing, transmission overhead, localization accuracy and latency,
- implications of location estimation protocols for location-based routing and clustering techniques.

In this paper, a computational geometrical-based localization technique is presented. The proposed location estimation scheme works in the following manner.

During the first stage, the sink node begins the trapezoid formation process on the sea surface by activating the trapezoid formation agent (TFA) and by deploying an autonomous underwater vehicle (AUV) to reach a particular depth below the surface of the sea. The AUV travels across the linear trajectory of a fixed length, at a specific depth, and the TFA creates trapezoids in the upper and lower portions of the path. The TFA stores the relevant information in the sink knowledge base (SKB) and in the node knowledge base (NKB). In the meantime, the TFA develops also the SDS in order to locate the node in the easiest manner possible.

During the second phase, position of the node is determined by relying on two methods. The first method determines the node's location by utilizing the SDS, and the other consists in finding the location of all the nodes by traveling across the trajectory. In any case, the sink triggers the localization agent (LA) and deploys the AUV to a specific depth under the surface of the ocean.

In the case of finding the location of one node, the LA moves directly to the trapezoid, which is given per the SDS, and performs the localization process.

In the case of determining the position of all nodes, the AUV traverses along the continuing trajectory and transmits beacon messages which contain real-time locations at specific points. The anchor agent (AA) at the anchor node receives these beacon messages, measures the signal strength and localizes itself based on the position of the broadcast point and the received signal strength. The LA begins the location estimating activity with the associated trapezoids of the anchor nodes, relying on location estimation techniques.

All agents keep updating the information to the respective knowledge bases whenever the data is modified.

Stability Oriented Cluster Dynamism in VANET (SOCDV)

Publisher: IEEE

3 Author(s) A.V. Sutagundar ; Pampapati Hubballi ; Ravikant Belagali **View All Authors**

Abstract: Network stability and communication stability are the major concerns, which have tremendous impact on the network performance in the recent advanced networks. Vehicular A... **View more**

Metadata

Abstract:
Network stability and communication stability are the major concerns, which have tremendous impact on the network performance in the recent advanced networks. Vehicular Ad-hoc Network (VANET) is the promising network to facilitate the error free communication services to the users. In this paper, we proposed the Stability Oriented Cluster Dynamism in VANET (SOCDV) to enhance the cluster stability. The main objective of SOCDV is to present an approach for cluster head selection based on different parameters. Due to vehicles mobility, VANET facing stability issue in clustering, which has great impact on the communication. Cluster stability mainly influenced by mobility, direction, density, distance and connectivity. Since proposed SOCDV scheme forms the cluster and elects the Cluster Head (CH) by considering these influenced factors to eliminate the clustering instability. The SOCDV scheme is simulated in C++ to test the performance in terms of cluster head selection time and cluster lifetime.

Published in: 2016 International Conference on Computation System and Information Technology for Sustainable Solutions (CSITSS)

Date of Conference: 6-8 Oct. 2016 **INSPEC Accession Number:** 16525814

Date Added to IEEE *Xplore*: 12 December 2016 **DOI:** 10.1109/CSITSS.2016.7779406

Publisher: IEEE

ISBN Information:

Conference Location: Bangalore, India

Wavelet Based Image Indexing and Retrieval

Publisher: IEEE

Cite This

3 Author(s) A.V. Sutagundar ; S.S. Manvi ; S.R. Bharamgoudar **View All Authors**

Abstract: In this paper we present wavelet based image indexing and retrieval system for color images. Highly de-correlated wavelet coefficient planes are used to acquire a search ... **View more**

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Abstract:
In this paper we present wavelet based image indexing and retrieval system for color images. Highly de-correlated wavelet coefficient planes are used to acquire a search efficient feature space. In this work low level feature, dominant color of the several images is extracted and keys are generated. The image key represents the image content with respect to other images in the database. At the time of the query, feature vector of the query image is computed and the database is searched for the matching feature vectors. All the images corresponding to the matched feature vectors are found to be similar images.

Published in: 2008 First International Conference on Emerging Trends in Engineering and Technology

Date of Conference: 16-18 July 2008 **INSPEC Accession Number:** 10141129

Date Added to IEEE *Xplore*: 29 July 2008 **DOI:** 10.1109/ICETET.2008.129

CD: 978-0-7695-3267-7 **Publisher:** IEEE

ISSN Information: **Conference Location:** Nagpur,

Remote information gathering in wireless satellite based sensor networks

Publisher: IEEE

3 Author(s) Manjunath H. Pujari ; Ashok V. Sutagundar ; Padmaja Kuruba **View All Authors**

Abstract: This paper discusses an energy efficient remote information gathering in wireless satellite based sensor networks to enhance the lifetime of networks. The Satellite Senso... **View more**

Metadata

Abstract:
This paper discusses an energy efficient remote information gathering in wireless satellite based sensor networks to enhance the lifetime of networks. The Satellite Sensor Networks (SSNs) is composed of group of sensor nodes, sink nodes, earth station, satellite as gateway and destination. Each of sensor nodes collects the physical information and encapsulated to cluster head in monitoring area. The encapsulated information has been transmitted to sink node. The sink node is transmitting information to satellite with uplink frequency. Once connection established between the satellite and ES, information exchange will take place with up/down link frequency of satellite. In this paper an effort has made to improve network life time with efficient energy consumption. Proposed method has two parts; establishing connection between satellite and ES and Inter satellite link establishment. The proposed method is to improve the network life with balanced energy consumption. The reference metrics are packet delivery ratio, energy consumption and delay. The simulation result shows that proposed method performance in terms of above mentioned metrics.

Published in: 2017 International Conference on Computing Methodologies and Communication (ICCMC)

Date of Conference: 18-19 July 2017 **INSPEC Accession Number:** 17562647

DOI: 10.1109/ICCMC.2017.8282708

Machine Learning based Vehicle-to-Infrastructure Communication in VANETs

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***Abstract*—Vehicular network plays a major role in understanding the detail study of vehicle communications. Multiple vehicles in local communication range need to exchange the safety and infotainment information via common roadside infrastructure in Vehicular Ad hoc Networks (VANETs). Vehicle-to-Infrastructure (V2I) communication model help to improve the efficiency of intelligent transport system by providing safety warnings and reducing vehicle collisions. Machine learning is an artificial intelligence component that gives the machine an ability to automatically learn without being expressly trained to improve from experience. Since VANET is imprecise and uncertain in nature, Machine Learning (ML) and Software Agents (SAs) combining approaches resolve the issues of V2I communication challenges in VANETs. This paper proposes ML based V2I Communication in VANETs using software agent approach. The proposed agent-based model is made up of both static and mobile agents. Proposed model executes decision tree algorithm and Q-Learning algorithm to identify the event as non critical or critical and the destination vehicle respectively to improve bandwidth utilization, packet delivery ratio and end-to-end delay.**

Keywords: Vehicular ad hoc networks, V2I routing, Software agents, Decision tree, Q-Learning

I. INTRODUCTION

An Intelligent Transportation System (ITS) is a network that uses applications to track, control and develop transportation systems to improve the quality of transportation. In recent years traffic incidents, road congestion, excess fuel use and environmental pollution have become serious global problems due to the large number of vehicles. VANETs concentrate on road safety and effective traffic control for public roads, while offering drivers and passengers comfort and entertainment during their journeys. VANETs are highly dynamic networks and have restricted access to the network infrastructure. Vehicle to Vehicle (V2V), Vehicle to Infrastructure (V2I), and Hybrid [1] [2] are the three communication modes in VANET. The communication media used in V2V has a short latency and a fast transmission rate. In a V2I network, applications that use infrastructure points (RSUs) to multiply resources via popular internet portals are taken into account. Hybrid mode is a fusion of both V2V and V2I techniques.

V2I networking refers to wireless sharing of data among vehicles and road infrastructure, which is facilitated through a system of software, hardware and firmware. It is bi-directional, with infrastructure components including lane markers, traffic lights and road signs. It is primarily intended for safety applications such as avoiding motor crashes, ambulance assistance and accomplishing a wider range of mobility.

Computational intelligence and machine learning allow computers to learn from data iteratively rather than being directly programmed, allowing them to uncover hidden insights [3]. There are three types of machine learning approaches currently available: supervised, unsupervised and reinforcement learning.

A software agent is a goal-oriented computer simulation that responds to its situation and runs independently to perform a task for an end user [4] [5]. Cognitive agents are objects that use a Belief-Desire-Intention (BDI) architecture and have recently gained popularity due to their human-like reasoning [6]. Cognitive agents, on the other hand, are usually static agents that need more calculation and databases.

The operational sequence of proposed ML based V2I communication in VANETs is as follows. (1) EDA in vehicle agency detects the event as critical or non-critical based on decision tree algorithm using vehicle sensor outputs. (2) EIA communicates the generated event to the corresponding RSU. (3) RSUMA employs the Q-Learning algorithm to select the best neighbor RSU until the destination RSU is identified. (4) RSUIA builds a route between the source and destination vehicle by tracing the path back to the source RSU.

The remainder of the paper is laid out as follows. Section II reviews the ongoing research works. Section III gives insight of the construction of proposed scheme in detail. The proposed scheme simulation model is outlined in Section IV. Results are analyzed in Section V. Finally, Section VI concludes the work.

II. RELATED WORKS

This section provide a brief survey of related works on routing in VANETs, Machine Learning (ML) techniques, and cognitive agent based solutions. Routing protocols for V2V and V2I communication with their advantages and disadvantages are presented in [7]. A routing algorithm for V2I scenario using distributed clustering algorithm is discussed in [8]. V2I communications was established to

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Stochastic Power Flow Analysis of Unbalanced Distribution System based on cluster of SWTG-SPV

Publisher: IEEE

Sangamesh Y. Goudappanavar ; Suresh H. Jangamshetti All Authors

Abstract: This paper presents stochastic 3-Φ power flow analysis of real-time unbalanced distribution system based on the aggregated and clustered model of Small Wind Turbine Gener... **View more**

Metadata

Abstract:

This paper presents stochastic 3-Φ power flow analysis of real-time unbalanced distribution system based on the aggregated and clustered model of Small Wind Turbine Generator (SWTG) and Solar Photo Voltaic (SPV) using OpenDSS. Single value decomposition based allocation and probabilistic approach of power-generation balance in every bus is modelled. 15 mins interval of wind velocity, solar irradiance and load data of Basaveshwar Engineering College (A), Bagalkot (BEC) profiles are recorded from Distribution Automation SCADA research laboratory for preparation of loadshapes. The proposed method is tested and validated on IEEE 15 and Europe LV Networks. Results for the studied High & Low Voltage (HV/LV) system indicate that buses with clustered (Distributed Energy Resources (DERs) have greater impact on voltage profile and thermal ampacity.

Published in: 2020 2nd PhD Colloquium on Ethically Driven Innovation and Technology for Society (PhD EDITS)

Identification of Fault Area in the Distribution System based on Rotor Angle behaviour of Diesel Generator

Publisher: IEEE

Cite This

PDF

<< Results

Sangamesh Y. Goudappanavar ; Suresh H. Jangamshetti ; Jai Jagadeesh O All Authors

Abstract: This paper presents identification of fault location based on coherency of Diesel Generators (DG) rotor angle in distribution system. Coherent behavior of DGs is identifi... **View more**

Metadata

Abstract:
This paper presents identification of fault location based on coherency of Diesel Generators (DG) rotor angle in distribution system. Coherent behavior of DGs is identified by similar characteristics and modelled using network reduction technique and performs stability analysis. Modelling of coherency based network reduction method for transient stability study of distribution system is developed using MiPower simulation package. Performance of proposed method has been tested on a Basaveshwar Engineering College (A), Bagalkot (BEC) 11-Bus distribution system and carried out a fault point/fault area identification. Proposed method is verified for connected load of BEC 11 bus distribution system. Further, analysis has been carried out for hourly load data measured on 6th May 2019, SCADA for Distribution Automation Research Laboratory, BEC. Three phase to ground fault is considered as a disturbance at different buses in BEC 11 Bus distribution system and correlation factors of DGs rotor angle is identified. It is observed from results that, time frame of small signal stability is within 20 seconds and fault location is identified. The outcome/characteristics of proposed method aids for operation and secure maintenance of existing distribution system

Performance Assessment of SPV Powered DC Irrigation Pumps with Solar Tracking Mechanism

Publisher: IEEE

Basanagouda F. Ronad ; Santosh B. Kumbalavati All Authors

Abstract: This paper presents the performance of SPV DC irrigation pumps with and without solar tracking mechanism. HOMER software is used for simulation. Simulation model is built... **View more**

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Abstract:
This paper presents the performance of SPV DC irrigation pumps with and without solar tracking mechanism. HOMER software is used for simulation. Simulation model is built for a 5 HP DC irrigation pump load. Local solar radiation data of Bagalkot, India are employed for the study. Developed HOMER model is standalone system with support of batteries. Constant DC load profile for seven hours/day is employed for the analysis. Further, simulations are carried out with different types of solar tracking mechanisms. SPV panel tracking with Monthly, Weekly, Daily & Continuous Adjustment of Horizontal Axis, Continuous Adjustment of Vertical Axis and Two Axis Adjustment are employed to attain the simulation results. For each tracking method, optimal configurations of SPV panels & batteries are listed and various costs corresponding to initial capital, operating, net present and cost of energy, capacity shortage & electricity generation details are tabulated. Comparative analysis amongst different types tracking is taken up. Results revealed that tracking of panels will enhance power production and in particular Two Axis Adjustment method will yield highest amongst all the tracking mechanisms.

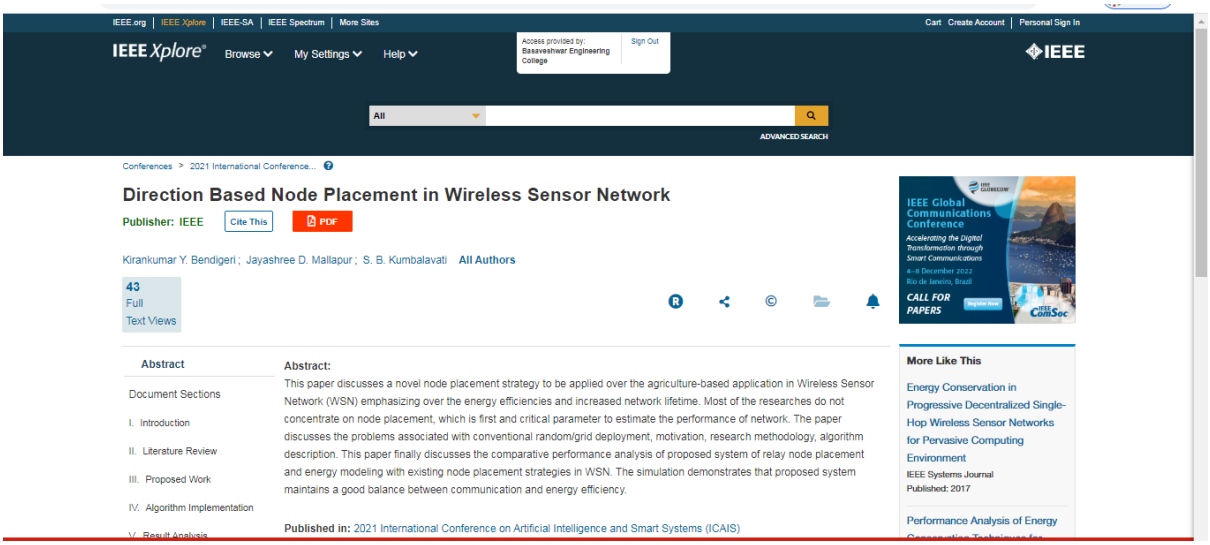
Pre Emptive Multitasking Algorithm based Resource Sharing Controller in Vehicular Cloud Networks

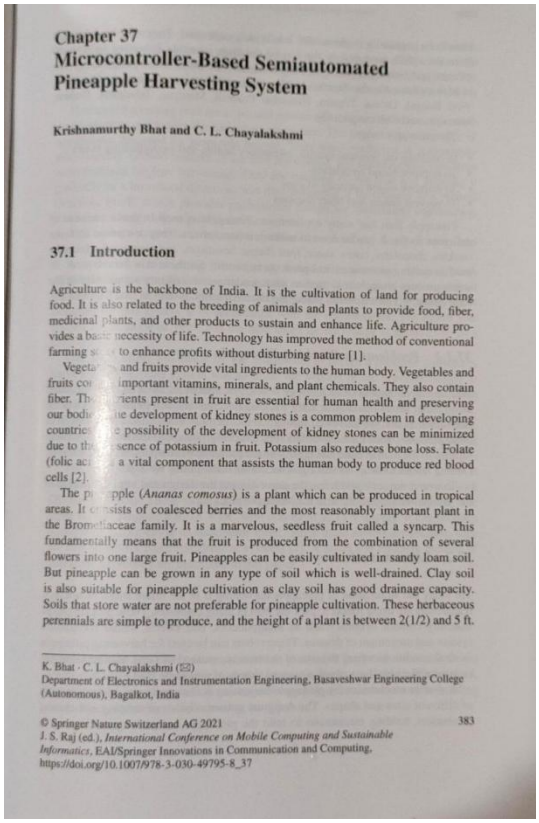
Publisher: IEEE

Mahantesh G. Kambalimath ; Mahabaleshwar S. Kakkasageri All Authors

Abstract:
Time constrain is one of the most critical aspects of the real time system. This applies to Vehicular Cloud Networks (VCN). One of the most promising feature of VCN is to form the Vehicular Cloud (VC) and to share the resources (CPU, RAM etc). In this position paper, we propose an preemptive algorithm based resource sharing controller for VCN. The scheduler will ensure the low priority task will be interpreted by the high priority task. In VCN environment certain tasks are high priority one and many tasks which are considered to be low priority, the scheduler ensures that these high priority gets sufficient resource and preempts the low priority tasks. During the peak hours (more loads on the server) to make sure the resources are available, resource sharing is devised between clouds. The proposed scheduling model provides the better service in VCN environment.

Published in: 2020 5th International Conference on Computing, Communication and Security (ICCCS)





Chapter 37
Microcontroller-Based Semiautomated Pineapple Harvesting System

Krishnamurthy Bhat and C. L. Chayalakshmi

37.1 Introduction

Agriculture is the backbone of India. It is the cultivation of land for producing food. It is also related to the breeding of animals and plants to provide food, fiber, medicinal plants, and other products to sustain and enhance life. Agriculture provides a basic necessity of life. Technology has improved the method of conventional farming s[illegible] to enhance profits without disturbing nature [1].

Vegeta[illegible]s and fruits provide vital ingredients to the human body. Vegetables and fruits co[illegible] important vitamins, minerals, and plant chemicals. They also contain fiber. Th[illegible]ients present in fruit are essential for human health and preserving our bodi[illegible]ne development of kidney stones is a common problem in developing countrie[illegible]e possibility of the development of kidney stones can be minimized due to th[illegible]sence of potassium in fruit. Potassium also reduces bone loss. Folate (folic ac[illegible] a vital component that assists the human body to produce red blood cells [2].

The p[illegible]pple (*Ananas comosus*) is a plant which can be produced in tropical areas. It c[illegible]sists of coalesced berries and the most reasonably important plant in the Bromeliaceae family. It is a marvelous, seedless fruit called a syncarp. This fundamentally means that the fruit is produced from the combination of several flowers into one large fruit. Pineapples can be easily cultivated in sandy loam soil. But pineapple can be grown in any type of soil which is well-drained. Clay soil is also suitable for pineapple cultivation as clay soil has good drainage capacity. Soils that store water are not preferable for pineapple cultivation. These herbaceous perennials are simple to produce, and the height of a plant is between 2(1/2) and 5 ft.

K. Bhat · C. L. Chayalakshmi (✉)
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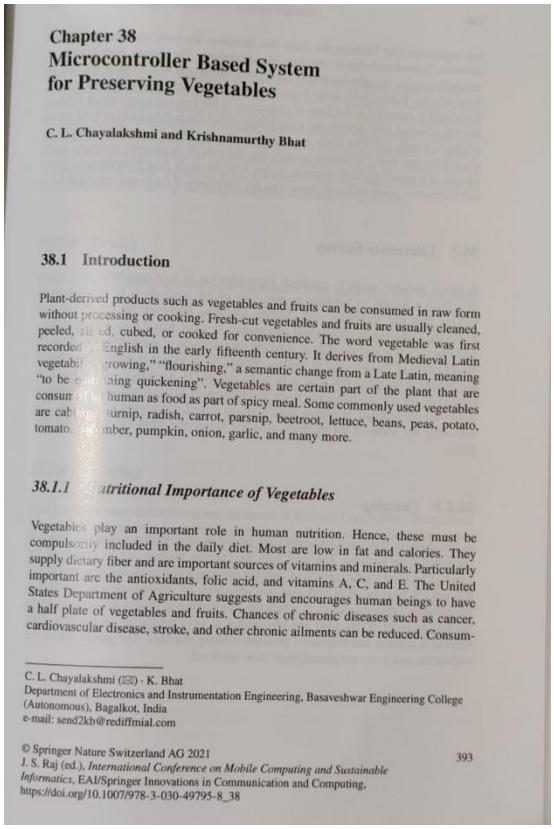
J. S. Raj (ed.), *International Conference on Mobile Computing and Sustainable Informatics*, EAI/Springer Innovations in Communication and Computing.
https://doi.org/10.1007/978-3-030-49795-8_37



Chapter 38
Microcontroller Based System for Preserving Vegetables

C. L. Chayalakshmi and Krishnamurthy Bhat

38.1 Introduction

Plant-derived products such as vegetables and fruits can be consumed in raw form without processing or cooking. Fresh-cut vegetables and fruits are usually cleaned, peeled, sliced, cubed, or cooked for convenience. The word vegetable was first recorded in English in the early fifteenth century. It derives from Medieval Latin vegetabilis "growing," "flourishing," a semantic change from a Late Latin, meaning "to be animating quickening". Vegetables are certain part of the plant that are consumed by human as food as part of spicy meal. Some commonly used vegetables are cabbage, turnip, radish, carrot, parsnip, beetroot, lettuce, beans, peas, potato, tomato, cucumber, pumpkin, onion, garlic, and many more.

38.1.1 Nutritional Importance of Vegetables

Vegetables play an important role in human nutrition. Hence, these must be compulsorily included in the daily diet. Most are low in fat and calories. They supply dietary fiber and are important sources of vitamins and minerals. Particularly important are the antioxidants, folic acid, and vitamins A, C, and E. The United States Department of Agriculture suggests and encourages human beings to have a half plate of vegetables and fruits. Chances of chronic diseases such as cancer, cardiovascular disease, stroke, and other chronic ailments can be reduced. Consum-

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I. S. Raj (ed.), *International Conference on Mobile Computing and Sustainable Informatics*, EAI/Springer Innovations in Communication and Computing,
https://doi.org/10.1007/978-3-030-49795-8_38

Wireless Sensor Networks and Its Application for Agriculture

Kirankumar Y. Bendigeri ✉, Jayashree D. Mallapur & Santosh B. Kumbalavati

Conference paper | First Online: 13 February 2021

Abstract

The wireless sensor network (WSN) is the most proven technology in today's world. WSN has gained its applications that are different from other networks and even the usage of WSN has

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Real-Time Monitoring of Crop in Agriculture Using Wireless Sensor Networks

Kirankumar Y. Bendigeri, Jayashree D. Mallapur & Santosh B. Kumbalavati

Conference paper | First Online: 03 February 2021

396 Accesses | 3 Citations

Part of the Lecture Notes on Data Engineering and Communications Technologies book series (LNDECT,volume 59)

Abstract

The paper works on the issue of wireless sensor network (WSN) employed in the agriculture application. Most of research works in WSN are dedicated for various applications like military, medical, home automation, and so on, where the primary intention was to introduce a technology for agriculture with the evolving sensor technologies. Such technology can be considered as E-agriculture. Proposed work consideres sugarcane as a crop under monitoring, where the work mainly aims at monitoring humidity (H), temperature (T), pressure (P), and light intensity (LI) required for the intended crop and also on the land using LBR and MBR routing

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Abstract

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Home / Archives / Vol. 29 No. 10s (2020) / Articles

Plate Wiper: A Novel Plate Washing Machine using Dry Sand and Wiper to Save Water

Arathi Nashi , Husnara Pinjar, Deepti Challagidad, Savita Girijavvagol, Krishnamurthy Bhat

PDF

How to Cite

Arathi Nashi , Husnara Pinjar, Deepti Challagidad, Savita Girijavvagol, Krishnamurthy Bhat. (2020). Plate Wiper: A Novel Plate Washing Machine using Dry Sand and Wiper to Save Water. *International Journal of Advanced Science and Technology*, *29*(10s), 4134-4138. Retrieved from http://sersc.org/journals/index.php/IJAST/article/view/21103

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Issue

Vol. 29 No. 10s (2020)

Section

Articles

Abstract

— Dish and plate wash is an art and it is an integral part of everyday life. Dishes and plates were cleaned manually for a long time by humans. As the technology advances, man-made semi and fully automated machines are invented to ease and enhance the life style. Be it manual or automated machine wash, the process of cleaning requires large amount of water. In order to save precious water, scientific community needs to invent machines which require less or no water for the said purpose. In this paper, a novel method of dish plate cleaning machine which uses sand instead of water is proposed. It is a microcontroller based fully automatic machine and the cleaning extent is expected to be highly acceptable. Plate washer is an electrically operated machine which washes the dishes cleanly in less time with minimum or no water and can be reused immediately. The proposed machine can save lots of water. In the wake of saving precious water and highly affordable cost, it has potential market value also. Two variants to be thought of: One for the general kitchen use and other for mass/large scale cleaning. The implementation of this machine is already initiated and it will be a boon to the individual and mass customers. The machine proposed in this paper is "Plate wiper" instead of "Plate washer".'

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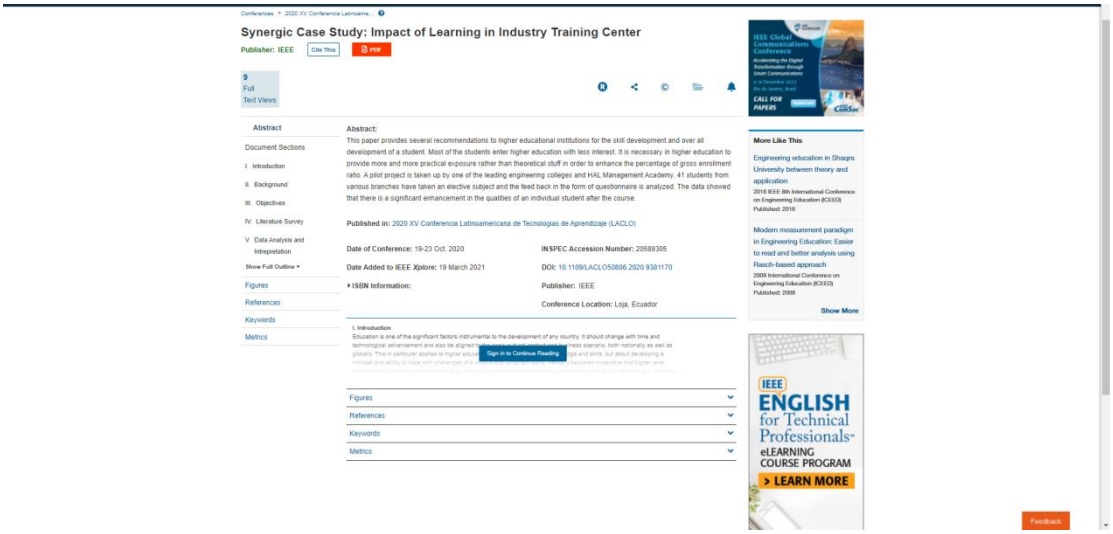

Conferences > 2020 XV Conferencia Latinoame...

Synergic Case Study: Impact of Learning in Industry Training Center

Publisher: IEEE Cite This PDF

9 Full Text Views

Abstract

Document Sections

I. Introduction

II. Background

III. Objectives

IV. Literature Survey

V. Data Analysis and Interpretation

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Figures

References

Keywords

Metrics

Abstract:
This paper provides several recommendations to higher educational institutions for the skill development and over all development of a student. Most of the students enter higher education with less interest. It is necessary in higher education to provide more and more practical exposure rather than theoretical stuff in order to enhance the percentage of gross enrollment ratio. A pilot project is taken up by one of the leading engineering colleges and HAL Management Academy. 41 students from various branches have taken an elective subject and the feed back in the form of questionnaire is analyzed. The data showed that there is a significant enhancement in the qualities of an individual student after the course.

Published in: 2020 XV Conferencia Latinoamericana de Tecnologias de Aprendizaje (LACLO)

Date of Conference: 19-23 Oct. 2020

INSPEC Accession Number: 20589305

Date Added to IEEE Xplore: 19 March 2021

DOI: 10.1109/LACLO50806.2020.9381170

ISBN Information:

Publisher: IEEE

Conference Location: Loja, Ecuador

I. Introduction

Education is one of the significant factors instrumental to the development of any country. It should change with time and technological advancement and also be aligned to [illegible] scenario, both nationally as well as globally. "This in particular applies to higher educ[illegible] and skills, but about developing a mindset and ability to cope with challenges of a [illegible] business imperative that higher level

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Figures

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Keywords

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Engineering education in Shaqra University between theory and application

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Advanced Glove for Deaf and Dumb with Speech and Text Message on Android Cell Phone

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Krishnamurthy Bhat ; C. L. Chayalakshmi All Authors

Abstract:
Most of us are blessed with natural ability to see, listen and interact. However, few people do not have this ability. Due to various reasons like birth defects, accidents, oral diseases, and environmental impacts the number of such people is rapidly increasing in the recent years. Most of the deaf and dumb use gesture and sign symbol for the communication. Sign language is the form of communication where shapes, arms or body, orientation and movement of hands, and facial expressions are systematically combined. But, sign language is ineffective in many cases. It may not be sufficient when such people are involved in the educational, social and professional environments where they want to interact with others. Therefore, there is an immediate need to have an advanced sign language detection and gesture recognition system. The need, design methodology and implementation strategies of a smart glove are discussed in this paper. The main objective of the work is to bring the technology for the help of differently abled people to communication effectively and in most meaningful form. The hand glove converts the hand/finger gestures in to meaningful voice messages over an Android phone. An app is designed using Android Studio for the said purpose. There are several works carried out across the globe for converting hand and finger gesture or sign language into speech. The work described in this paper uses NodeMCU as processing and wireless communication of data and it is most advanced form of all the hand glove designs so far.

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Focal Theme

GPS AND IOT BASED VEHICLE ON-ROAD BEHAVIOR MONITORING AND WARNING SYSTEM SUITABLE FOR TRANSPORT AUTHORITY

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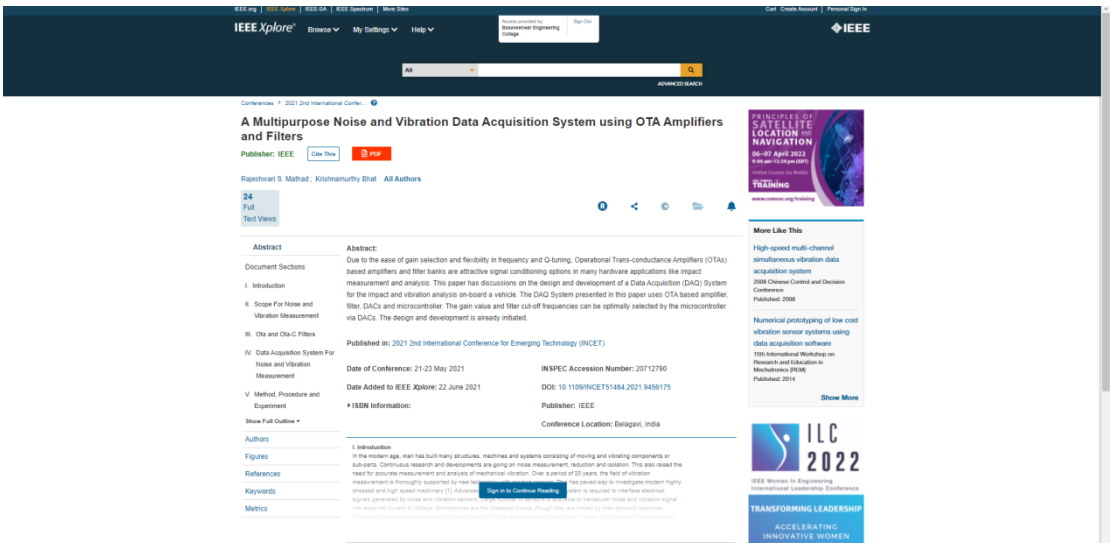
ABSTRACT

Objective/Aim: India and other populated countries are facing a threat of increasing road accidents and casualties. Most of the road accidents are caused due to the offences and violation of rules either by the accused or by the victim. Main cause for the road accidents are due to traffic rule violations. This paper describes an innovative and advanced method of monitoring the behavior of vehicles on the road and subsequently data base generation at the authority end to control the offenses.

Methods and materials: A robust and effective mechanism of monitor and control for the purpose of vehicle behavior monitoring is not available for Regional Transport Office (RTO) in India. A tare-proof electronic system consisting of many sensors and signal conditioning circuits is to be a part of the vehicles implemented by the manufacturers. This electronic system with an apt electronic controller will be installed in individual vehicle. The surveillance and monitoring system in places like one way, no parking and silent zones are to be installed by RTOs. Any violation of traffic rules such as over speed, one-way traffic violation, blowing horn in silent zones (hospitals, schools, parks), drunken driving, and parking in prohibited areas will be automatically informed to the authority of RTO over the internet. Monitoring the important traffic rules and regulations for each vehicle on the road is done through set of protocols. The monitored data will be available on cloud for RTOs.
Results: This is proposed work and implementation is already initiated by the authors. This will result into a robust and proper mechanism to support the authority to control the road offences and accidents.

Conclusions: An electronic system for the effective surveillance and monitoring of vehicles on the road is the need of hour, especially in India. We are proposing one such system here.

Keywords: Road accidents; vehicles; surveillance; traffic; electronic monitoring.



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Wireless Sensor Networks and Its Application for Agriculture

Kirankumar Y. Bendigeri, Jayashree D. Mallapur & Santosh B. Kumbalavati

Conference paper | First Online: 13 February 2021

220 Accesses | 3 Citations

Part of the Lecture Notes on Data Engineering and Communications Technologies book series (LNDECT,volume 57)

Abstract

The wireless sensor network (WSN) is the most proven technology in today's world. WSN has gained its applications that are different from other networks and even the usage of WSN has

Performance Assessment of SPV Powered DC Irrigation Pumps with Solar Tracking Mechanism

Publisher: IEEE Cite This PDF

Basanagouda F. Ronad ; Santosh B. Kumbalavati All Authors

Abstract

Document Sections

I. Introduction

II. Resources for Modeling

Abstract:

This paper presents the performance of SPV DC irrigation pumps with and without solar tracking mechanism. HOMER software is used for simulation. Simulation model is built for a 5 HP DC irrigation pump load. Local solar radiation data of Bagalkot, India are employed for the study. Developed HOMER model is standalone system with support of batteries. Constant DC load profile for seven hours/day is employed for the analysis. Further, simulations are carried out with different types of solar tracking mechanisms. SPV panel tracking with Monthly, Weekly, Daily & Continuous Adjustment of Horizontal Axis,

Direction Based Node Placement in Wireless Sensor Network

Publisher: IEEE

Kirankumar Y. Bendigeri ; Jayashree D. Mallapur ; S. B. Kumbalavati All Authors

Abstract:
This paper discusses a novel node placement strategy to be applied over the agriculture-based application in Wireless Sensor Network (WSN) emphasizing over the energy efficiencies and increased network lifetime. Most of the researches do not concentrate on node placement, which is first and critical parameter to estimate the performance of network. The paper discusses the problems associated with conventional random/grid deployment, motivation, research methodology, algorithm description. This paper finally discusses the comparative performance analysis of proposed system of relay node placement and energy modeling with existing node placement strategies in WSN. The simulation demonstrates that proposed system maintains a good balance between communication and energy efficiency.

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A Comprehensive Review of Access Control Mechanism Based on Attribute Based Encryption Scheme for Cloud Computing

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ABSTRACT

Cloud computing is the most prevailing paradigm, which provides computing resources and services over the Internet. Due to immense development in services provided by cloud computing, the trend to share large-scale and confidential data on cloud has been increased. Though cloud computing provides many benefits, ensuring security of the data stored in cloud is the biggest challenge. The security concern about the data becomes main barrier for adoption of cloud. One of the important security aspects is fine grained access control mechanism. The most widely used and efficient access control scheme for cloud computing is Attribute Based Encryption (ABE). The Attribute Based Encryption (ABE) scheme provides a new technique for embedding access policies cryptographically into encryption process. The article presents an overview of various existing attribute-based encryption schemes and traditional access control models. Also, the comparison of existing ABE schemes for cloud computing, on basis of various criteria is presented in the article.

KEYWORDS

Access Control, Attribute-Based Encryption, Cloud Computing, Outsourcing

INTRODUCTION

In today's era, cloud computing has become an attracting technology, which has brought extreme changes to IT industry. Cloud Computing enables network access to various computing resources such as servers, storage, networks, applications and services. It is basically a paradigm that provides access to shared pool of resources online on demand (Armbrust et al., 2010). It is computing over internet. The users can store any amount of data on cloud and then can access it at any time, from anywhere. The most fascinating benefit of cloud computing is that it provides cost saving as the users will pay only for their usage. Cloud computing is also termed as distributed computing over a network. The term cloud can be defined as collection of servers delivering computing resources as a service on demand. Generally, the cloud comprises various interfaces, networks, hardware, storage devices etc. (Majumder et al., 2014).

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Composites Science and Technology

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Vegetable Fiber Composites and their Technological Applications

Springer

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Tribological Behaviour of Glass Fiber Reinforced Polyamide Gears

Sandeep C. Dhaduti, S. G. Sarganachari, Arun Y. Patil, and Anish Khan

1 Introduction to Gears

Gears are wheels with tooth used for motion, power transmission and in most industrial rotating machine systems Gears are likewise utilized for changing speed of rotation of a machine shaft, alter the direction of the axis of revolution and change rotating to linear movement and the other way around. These are preferred to transmit power over a short center distance positively with constant velocity ratio. Because of a portion of the constraint of metallic gears like lubrication, noise, weight, cost, productivity and so forth, center has now been quickly changing upon polymer gears since most recent past years. Consequently, the assessment of gear failure is significant for upkeep wanting to fundamentally decrease downtime and cost [1]. Polymer gears pose many advantages upon metallic gears and are preferred because of no or less lubrication requirement, low noiseless operation, light weight, economic in production, good vibration absorbing property, impervious to erosion. But on the other hand these polymer gear drivers have low load carrying capacity, limited operating temperatures and less dimensionally stable.

The suitable element for plastic gears ought to have posed enhanced mechanical properties like modulus of rupture, resistance for deformation and compressive loads, low coefficient of friction, wear and fracture resistance of gear tooth. Thermoplastics

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Fine-Grained Sentiment Rating of Online Reviews with Deep-RNN

Ramesh Wadawadagi and Veerappa Pagi

Abstract Increasing volume of customer reviews over the commercial Web sites have created a demand for the construction of automated content analysis systems. However, present techniques mainly focus on traditional bag-of-words (BOW) and statistical language models, ignoring semantic compositions. In contrast, deep neural networks (DNN) have exhibited greater stability in equipping on-scale sentiment prediction. Particularly, deep recursive neural networks (Deep-RNN) have been consistently used for capturing semantic compositions in natural language content when represented with structured formats (e.g., parse trees). Improved word spaces (word-embeddings) on the other hand proved to be efficient in comprehending fine-grained semantic regularities. In this paper, a fine-grained sentiment rating of online reviews based on Deep-RNN is proposed. The performance of the proposed model is evaluated through the conduction of experiments over Stanford sentiment treebank (SST) dataset. Furthermore, the effect of tuning hyper-parameters on the performance of the network is studied. The experimental results reveal that Deep-RNN exhibits better prediction accuracy compared to the traditional shallow counterparts.

Keywords Recursive neural networks · Sentiment analysis · Word-embeddings · Fine-grained sentiment rating · Deep learning

1 Overview

Online consumer reviews and ratings may influence positively or negatively any enterprise in this business world. This being the case, many online review systems offer star rating in addition to free text reviews. In spite of the fact that, different users

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CONTENTS

Agriculture Price Prediction Using Data Mining

Veeresh Kadlimatti, Basaveshwar Engineering College, Bagalkot
S V Saboji, Basaveshwar Engineering College, Bagalkot

Abstract:--

Agriculture is the main source and backbone of Indian Economy and plays a vital role in individual life. In the total Gross Domestic Product (GDP) agriculture nearly contributes sixteen percent and for increasing foreign exchange it contributes nearly ten percent to the total country exports. As the population continuously increasing and to manage the livelihood of the country there's requires a proper utilization and management of agriculture products. Data mining is a better technique and best choice in predicting the accurate prices of the agriculture based on previous data. In this work various data mining algorithms are applied on the dataset to predict the future prices of the agriculture products. Keywords: Agriculture, Data-Mining, Prediction.

Keywords
Agriculture, Data Mining, Prediction, Regression.

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This is to certify that Mr./Ms. Dr. S.V. Saboji
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in the Fifth National Conference on Multimedia Technology and Communication System (NCMTCS-2019) held on 10th & 11th May 2019 organized by the Department of Computer Science and Engineering, Malnad College of Engineering, Hassan *under* TEQIP-III.

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Establishing Trust Worthy Reliable Path In Mobile Adhoc Network Using Mobile Agent

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Mobile Ad-hoc Network (MANET) is a collection of independent mobile nodes that communicate with each other by forming multi-hop radio network. Routing is the primary problem in MANET. There are some limitations due to mobility of nodes in MANET. Because of the active topology and decentralized structure of a network, sometimes nodes may break routes. Frequent link failure results in packet loss, increase in delay. So the proper selection of an intermediate node for packet transmission is a bit difficult job. E-TWRP (Establishing Trust Worthy Reliable Path) in MANET. This protocol empower nodes not only relay the packets but also retain the route reliability. Trusted party maintains trust updation and credit account. Those nodes who are actively participating in the network they get rewarded. Their establishes reliable and optimal path between the nodes.

Keywords: Trusted party, Adhoc Network, Reliable route.

I. INTRODUCTION

In Mobile Ad-hoc Network nodes area unit unengaged to move anyplace within the network with none mounted topology and centralized structure. Figure shows that nodes A and B changes their position with totally different path. In Edouard Manet any node will enter and leave the network at any

Multimodal Biometrics Database for Person Authentication :VTU-BEC-DB

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Multimodal Biometrics Database for Person Authentication :VTU-BEC-DB

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***Abstract*—This Though many standard databases are available for Biometric research, a robust multimodal database is not found. In this paper, a new multimodal biometric database, constructed with three traits namely face, hand and voice is described. These biometric traits are acquired from 100 persons(i.e. 36 males and 64 females) with age range between 18 and 50 years. The database (VTU-BEC-DB) is created at the Department of Computer Science and Engineering at Basaveshwar Engineering College (BEC), Bagalkot under Visvesvaraya Technological University (VTU), Belagavi, Karnataka, India. Face images are collected indoor in controlled scenarios with white background and variation in illumination and pose and also by varying the pixel resolution of the camera. The peg free hand images from both right and left hands are collected from the book-scanner in the indoor environment with natural light and also by varying the illumination through fluorescent lights. The voice samples are recorded in two languages namely Kannada i.e. Indian language and English numerals by uttering zero to thirty. These dataset can be used separately for experimentation by the research community.**

Keywords — Multimodal Biometric Database, Biometric traits, Face, Hand, Voice

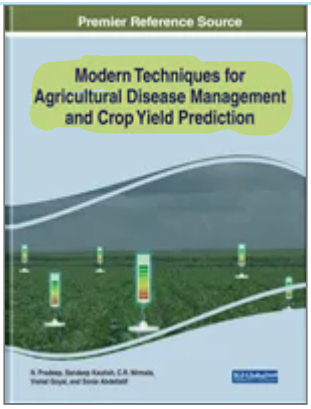
I. INTRODUCTION

In the modern society use of the information technology based systems has pervaded all walks of life. These systems are more vulnerable to hacking and usurpation of personal identification. Security and identification are very essential for proper usage of IT based systems. Biometric technologies are becoming the basis of a wide array of highly secure identification and personal verification solutions. The biometric system allows identification/verification of individuals based on the physical(i.e. anatomical) or behavioral characteristics which cannot be stolen easily[1]. Various biometric technologies are developed such as fingerprint, face, iris, retina, voice, signature, gait, keystrokes and hand geometry. The biometric systems are categorized as either unimodal or multimodal biometric systems. Unimodal biometrics systems rely on the evidence of a single source of information i.e. physiological or behavioral information for authentication [2] . The unimodal systems have to contend with a variety of problems such as, noise in sensed data, intra-class variations, inter-class similarities, non-universality, and possibilities of spoof attacks. The inherent properties of biometric traits and the constraints of sensing technologies will limit the performance of the unimodal biometric system. Some of the limitations imposed by unimodal biometric systems can be overcome by including multiple sources of physiological or behavioral information for establishing identity [3]. Such systems, known as multimodal biometric systems, are expected to be more reliable due to the presence of multiple, (fairly) independent pieces of evidence [4]. These systems are able to meet the stringent performance requirements imposed by various applications. They address the problem of non-universality, since multiple traits ensure sufficient population coverage. They also deter spoofing since it would be difficult for an impostor to spoof multiple biometric traits of a genuine user simultaneously. The researchers are also making efforts in developing the databases along with deploying the biometric systems. The researchers constructed the “chimeric” multimodal databases by combining the biometric data from different unimodal databases to perform multimodal biometric research [5]. Such multimodal databases fail to represent real multimodal samples of the users. Hence, the construction of the "chimeric" multimodal databases are not preferred as the biometric data are uncorrelated. The multibiometric data may be necessarily correlated [6], hence there is a scope to build a new multibiometric database by acquiring the multiple trait data from the users. In the proposed work, the multimodal database (VTU-BEC-DB) is constructed by collecting the face, hand and voice biometric trait data from the 100 persons with age range between 18 and 50 years. Face images are collected indoor in a controlled scenarios with white background and variation in illumination and pose. The peg free right hand and left hand images are collected from the Book scanner with black-colour background. From every person 12 samples of the right hand and 12 samples of the left hand images are collected. Similarly, Voice database is a collected in two sessions over a period of one year. In each session, five set of recordings of English and five set of recordings of Kannada languages numerals utterance of zero(0) to Thirty(30) are recorded.

The rest of the paper is organized into four sections: section 2 reviews the developments in multimodal biometric databases. The construction of the proposed VTU-BEC-DB multimodal database is described in section 3. The scope and limitations of Database created are enlisted in section 4. Section 5 provides the conclusion of the work.

II. REVIEW OF RELATED WORK

Several multimodal databases are available for the researchers for experimenting and developing multimodal



Agro Guardian: A Smart Agriculture Framework for Precision Farming

Sanjeevakumar M. Hatture (Basaveshwar Engineering College (Autonomous), India) and Susen P. Naik (Basaveshwar Engineering College (Autonomous), India)

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Abstract

The mechanization of the process creates agriculture-based jobs for farmers, providing financial support and facilitating affordable agriculture equipment and machineries. Fruits markets are subject of opportunity and it is important to the suppliers to identify the quality of fruits based on the ripeness level of fruits before selling out in order to get higher level of profit. The proposed framework is an Android application in native language of the farmer to help the jobless farmers to find agriculture-based jobs suitable to their skill set and receive investments from various investors across the country. Further, it finds investment for the needy farmers and create suitable agricultural employment for jobless farmers so that there is an increase in the progress in the field of agriculture. It also facilitates the farmers with advanced equipment for performing various agricultural tasks, obtains the land on lease, and determines various stages of ripeness of fruit and provides the information about the government project and funding facilities.

Chapter Preview

Top

Introduction

Agriculture is acceptably in which people have begun to be lethargic, forgetting so far what is keeping them energetic and alive. Although there are many numbers of hardworking, obsessive farmers and their life runs or rests only on farming or agriculture. However, there's is lot of corruption keep's on increasing these days due the intervention of the third party in marketing the agriculture products. The main motivation behind Agricultural Marketing and Department of Agricultural Business is to ensure

feasible price to the agriculture product and helps the farmer in competitive marketing scheme and also in implementing modern technologies that reduces the losses to farmer and encourages in more cultivation. India is most populated country, as compared to different economic category. Agriculture is important sector for economic in many countries like India. Presently the agriculture area contributes 18% of Gross Domestic Production (GDP). Various private and government agencies have straightly involved in agriculture area for develop the economics of the country. There is no success is obtained in agriculture sectors due to poor agriculture price, difficulties in contacting the dealers, lack of technology information and network connectivity etc. No proper mechanism or system to alleviate these complications.

The fundamental desire of farming is to bring improved marketing facilities, reduce trade performance, and eliminate market expenditure which facilitates the prominent budget to the efforts made by the farmers. Farmer is one of the most important people in every human being's life since the beginning of civilization. India gains food only if farmer cultivates the crops and manages many agriculture activities. There is much responsibility to farmer which makes their life tough and difficult. Even though farmer is rich enough to serve the food for every individual of the society but poor himself due to improper pricing for their cultivation, illiteracy, lack of the global knowledge, dependency on single source. Farmer remains happy if the cultivated crops are in good quality by the favorable environmental condition and better pricing. Since, the farmer's family is depending on cultivation if crops are not as per the demands then Farmer life becomes depressed. Farming work is a low admired job, especially regular agricultural workers. In this modern era industry and construction sectors have occupied majority of agriculture's labors due to the high wages paid. Most of the times small scales farmer depend on the external sources like relatives, companions, friends and others and they end up in giving high interest rates (36 to 120% per year) for requirements that might be in the form of money. Despite of the large machineries and modern technology involved in agriculture some parts of the country agricultural operations and mechanisms are carried out by human hands or labor using simple and traditional tools for implementing wooden, plough, seeds sowing etc. It results in huge investments of money on human labor. Land is the most valuable property in Framer life. For many new farmers, especially in areas where lands are quite expensive, it becomes very difficult to afford for their own the land to farmers and searching land for cultivation becomes complicated. The entire factor provides bad impact on the economic situation.

Growths of local fruit or vegetables industries in India are very immense. But, exporting fruits to other is country is less compared to other products. Fruits market is always option for consumers. It is very essential for suppliers and farmers to identify and deal the quality of fruits before sending out to market. Currently, human beings are experts' in grade the agriculture products that is by examining on the visibility features. However, physical analysis provides the inaccurate, incompatible and ineffectual on denigrating the quality of farming products. The physical analysis after a certain period of times the farmer gets board of this job. In order to overcome this problem, there should be a automatic analysis for determining the quality of fruits which provide the results in more accurate and agreeable output. By these results, it is beneficial in saving time and manual labor which in turn helps in the development of economic.

Complete Chapter List

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Chapter 8
Agro Guardian:
A Smart Agriculture Framework for Precision Farming

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ABSTRACT

The mechanization of the process creates agriculture-based jobs for farmers, providing financial support and facilitating affordable agriculture equipment and machineries. Fruits markets are subject of opportunity and it is important to the suppliers to identify the quality of fruits based on the ripeness level of fruits before selling out in order to get higher level of profit. The proposed framework is an Android application in native language of the farmer to help the jobless farmers to find agriculture-based jobs suitable to their skill set and receive investments from various investors across the country. Further, it finds investment for the needy farmers and create suitable agricultural employment for jobless farmers so that there is an increase in the progress in the field of agriculture. It also facilitates the farmers with advanced equipment for performing various agricultural tasks, obtains the land on lease, and determines various stages of ripeness of fruit and provides the information about the government project and funding facilities.

INTRODUCTION

Agriculture is acceptably in which people have begun to be lethargic, forgetting so far what is keeping them energetic and alive. Although there are many numbers of hardworking, obsessive farmers and their life runs or rests only on farming or agriculture. However, there's is lot of corruption keep's on increasing these days due the intervention of the third party in marketing the agriculture products. The main motivation behind Agricultural Marketing and Department of Agricultural Business is to ensure feasible price

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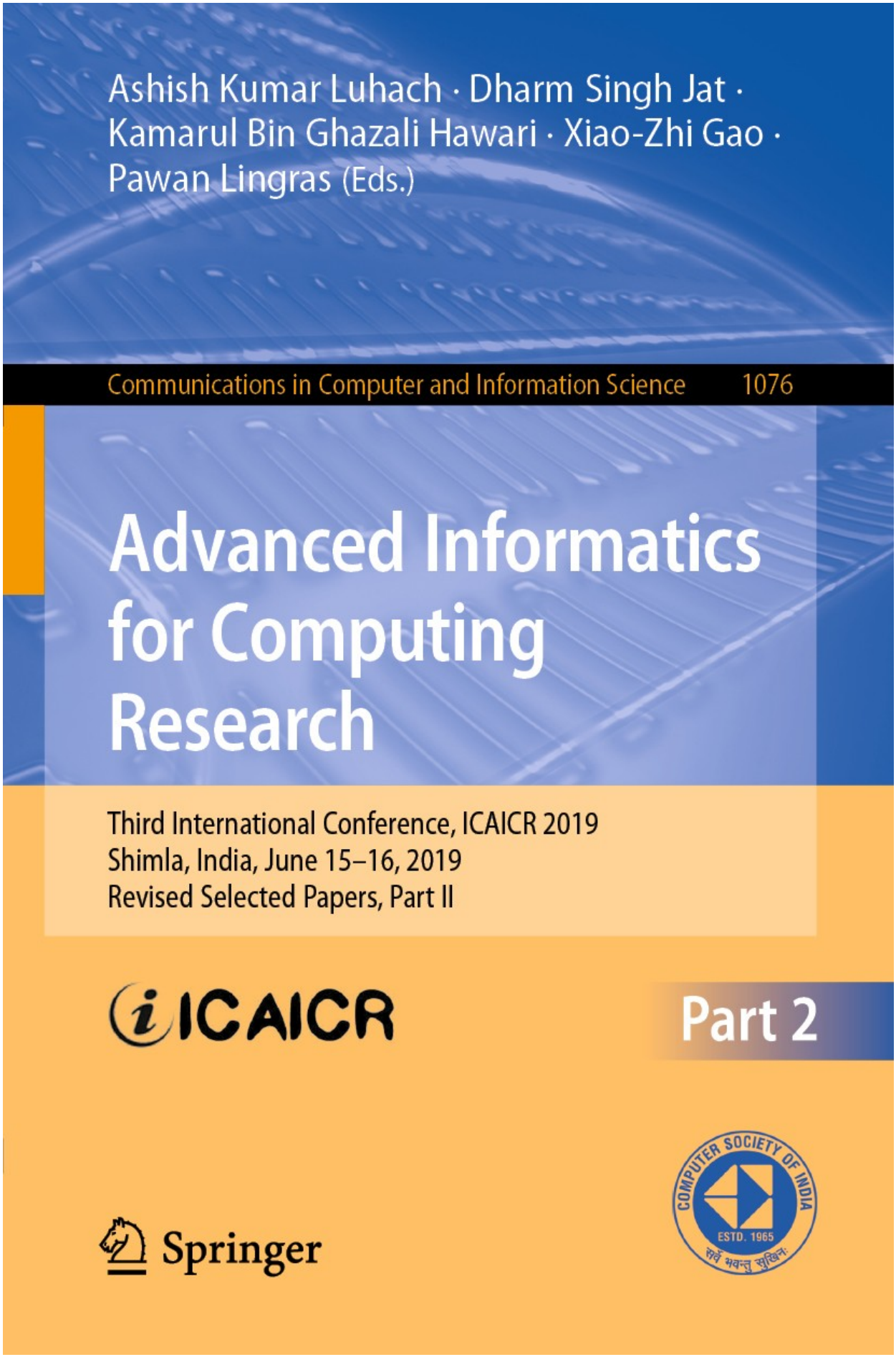
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Contents – Part II

Hardware

Smart Mirror using Raspberry Pi for Human Monitoring and Home Security

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Abstract. The Smart mirror is a system in which the regular mirror is converted into a smart device. The Smart mirror is designed using Raspberry Pi and a touch enabled screen. The designed system is capable of acting like a regular mirror in case of normal mode of operation and it acts like a smart mirror in a triggered mode of operation. The Smart mirror thus designed is an interactive system which is capable of accepting two modes of input namely touch and mobile based controls. The system is designed to display weather information, temperature and latest news on the mirror. The system is primarily designed as a home Security and Human Monitoring system. The proposed design is thought of as a package bundled with better features, which not only just displays information over screen, but also can be used for providing security. The system is built using hardware units like Raspberry Pi 3 model, touch screen, mobile device, camera and Python coding is used for software part. The system provides security against Intrusion in home. It is done using Background Subtraction along with Simple Frame Difference Approach. Once Intrusion is detected the administrator is sent alert message along with the photo of intruder. The Human Monitoring is implemented using Machine learning technique Yolo with OpenCV. During human monitoring mode of operation, if the Human under monitoring moves out of the vision range of camera, the administrator of Smart Mirror will be sent alert message. Using the mobile commands, the administrator can see the video streaming using camera fixed on the Smart Mirror.

Keywords: Smart Mirror, Raspberry Pi, Security, Intrusion Detection, Human Monitoring Mirror

1 Introduction

In the present world, the advancement in technology has converted almost every device as smart device. Ranging from household things to most advanced electronic gadgets, almost all are becoming smart. So having this thought in mind, here a smart is proposed, which is not only capable of displaying customized information on the display screen but also act smartly and provide security at home when needed. It is also capable of Monitoring Humans. People use mirrors

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KRISHI-SUVIDHA: A Framework For Smart Agriculture

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Abstract. Agriculture is the backbone of the country. About 70% percentage of India population belongs to agriculture family. Due to the digital India programme, agricultural applications have direct impact on the agricultural sectors. The way people go for buying the agricultural products is tedious. Often buyers or customers have to travel distant places to buy agricultural products and sometimes even the right quality is not ensured. Besides, farming is the main or primary occupation in India. Farmers are usually deceiveed by the middleman in today's market which leads to scarcity of grains. Fruits markets are subject of opportunity and it is important to the suppliers to identify the quality of fruits based on the ripeness level of fruits before selling out in market, in-order to get higher level of profit. The main objective of this work is to help farmers. An android application in native or regional language of the farmer to help the jobless farmers to find agriculture based jobs suitable to their skill set and receive investments from various investors across the country. Further to find investment for the needy farmers and create suitable agricultural employment for jobless farmers so that there is an increase in the progress in the field of agriculture. The prposed work of an android application is also facilitate the farmers with advanced equipments for performing various agricultural tasks, obtain the land on lease and it helps buying and selling agricultural products using a computerized approach, provide the scheme available to farmer and to determine various stages of ripeness of fruit. The application is simple and easy to use by the farmers and accumulate several agri based information at single place in multilingual applications.

Keywords— **Agriculture jobs, Android application, Cultivation, Finance and investments, Land lease, Marketing, Ripe track**

1. INTRODUCTION

Agriculture is the primary job in India. Although there are huge number of hardworking, obsessive farmers and their life runs only on farming but agriculture is not given primary importance. However there's is lot of corruption increasing these days due to the intervention of the third party in marketing the agriculture products. Agriculture is important sector for the increase in the economic for many developing countries like India. Presently the agriculture area contributes 18% of Gross Domestic Production (GDP) [1]. Various private and government agencies have directly involved in agriculture fields for developing the economics of the country. There is no direct success is obtained in agriculture sectors due to poor agriculture price, difficulties in contacting the dealers, lack of technology information and network connectivity etc. Farming work is a low admired job, especially regular agricultural workers. In this modern era industry and construction sectors have occupied majority of agriculture's labors due to the high wages being paid. Despite of the large machineries and modern technology involved in agriculture, some parts of the country agricultural operations and mechanisms are carried out by human hands or labor using simple and traditional tools for implementing wooden, plough, seeds sowing etc. It results in huge investments of money on human labor. Land is the most valuable property in Framers' life. For many new farmers, especially in areas where lands are quite expensive, it becomes very difficult to afford for their own the land to farmers and searching land for cultivation becomes complicated. Fruits market is always option for consumers. It is very essential for suppliers and farmers to identify and deal with the quality of fruits before sending out to market. Currently, human beings are experts in grading the agriculture products that is by examining on the visibility features. However, physical analysis provides the inaccurate, incompatible and ineffectual on denigrating the quality of farming products. In order to overcome this problem there should be an automatic analysis for determining the quality of fruits which provide the results in more accurate and agreeable output. By these results, it is beneficial in saving time and manual labor which in turn helps in the development of economy.

In the 21^{th} century all the human beings live in modern, digital and technical adapted for their daily requirements. The smart phone is most commonly used all over, and farmers have started to use mobile phone for communication [2]. But they need to recognize the significance of smart phone and new technology, so it can help them in direct communication involving the farmers and buyer or customers. By investigating and considering the entire problem faced by farmers, the author has introduced an android application which involves various features.

Farmers need to download this application on their mobile phones so that they can easily search for jobs online and also post ads regarding the jobs. Most farmers now have to understand the operating and maintaining sophisticated machinery. So it provides them with an opportunity to post their machineries for rent to other farmers and also help the other farmers to find machineries for their work [3]. This application also helps the farmers in finding the investors who are ready to invest on lands also there is another feature which helps them in finding lands for lease. It helps them in selling and buying agriculture commodities and services locally without middlemen through an add/listing which they can post right from their mobile. It also helps the farmer to get most updated schemes available to farmer. Finally it helps thefarmer to check fruit ripeness level easily at any place and anytime.

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Age Estimation of Person Based on Face Features

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***Abstract*— In the era of information technology the social media and other sources of evidence are usually used to spot suspects and victims of crimes by police. Investigators generally use individual characteristics like gender, age, weight, height, etc. from unknown speculate to testimony in their perception. For example in child abuse investigations victim age is essential in the detection of the offenses' classification. Machine learning methods are used in the analysis of digital photographs to identify soft biometric. Investigator benefits from this to improve their cases. This paper presents an efficient intelligent system for age estimation of a person's by employing the facial features. The facial information employing the deep learning technique that is transfer learning based on Convolutional Neural Networks will estimate the age of the person. The method contains pre-trained model, convolutional base, and classifier. The proposed method is efficient and outer performs the state-of-the-art techniques.**

Keywords*— *Age, Convolutional Neural Network, Deep Learning, Face, Intelligent system, Transfer Learning,

I. INTRODUCTION

Biometric is branch of computer science that studies the traits of humans for identification, access control or surveillance purposes. Digital image accomplish various aspects like gender, age and facial expression by quick glance. From the last few years, facial identification is the main stream media for various products particularly in deliverance of Apple iPhone X. In this product, primary authentication technology that is facial recognition that overcomes the traditional finger print authentication. Among the various applications sophisticated facial recognition is in effective improvement all over worldwide. Facial recognition technology has used by china in several applications such as pay with smile and jaywalker identification. Also, used in the churches to track worshipers and to stop shoplifters. Age estimation is used for broad area of offenses particularly in child abuse inspection, adult entertainment; purchase age limited things such as liquor and tobacco, and also restricted age videos. Among many fields researchers are age estimation of subjects is often difficult, since it is sophisticated and annoying task to urge done and by applying the various methods of machine learning algorithms constantly rising the precise obtained outcome. Moreover, differentiate the marginally under-age from the marginally super annulled is required but present techniques are not trustworthy to accomplish job. For rhetorical investigation scanning the surface of disk for important price has long been time overwhelming task. Nevertheless, techniques of machine learning and computer vision may be based on digital rhetorical specialist achieves automatic file techniques, flag entirely completely different quite information relevant to case in court and in digital rhetorical laboratories scale back the exposure of child abuse material. Throughout the globe abuse inquiry is usual incident on social control bureau, during this image classification based on age, gender is difficult and usually for digital detector crucial to decisive each image location. Equally, classifying the identical person whereas particularly not aware of their identification is may be very important potentiality. Shortage of data for training and testing is foremost needed issues in machine learning. Hence, there is a scope to develop algorithm/method to deal with this issue. This paper presents an efficient intelligent system for age estimation of person's by employing the facial features. Facial information employing the deep learning technique will estimate the age of the person. The method collects the real time facial information of a person for estimating the gender and age the proposed method for age estimation in this paper is further evaluated against the state-of-the-art techniques to validate its performance. The rest of the paper is arranged in such way that section 2 describes literature review, section 3 explains issues and challenges, section 4 describes proposed system, section 5 explains experimentation and results and conclusions are drawn in section 6.

II. RELATED WORK

Many researchers enumerable the age of person's by were arising with the formula for state-of-the-art techniques. Varieties of the recent techniques conferred within the papers are summarized as follows:

In a various case, exponentially developing storage capacities and at the same time there is need for digital rhetorical analysis, as result of this digital rhetorical expertise requires enormously accumulated amount of data than present capacities in social control bureau around the globe. Due to inadequate evidence there is delay in court cases and this results cases being dismissed [1]. There is less tendency of pursuance because of the anomaly in determinatives in the digital image the age of a victim depict [2]. Throughput of digital forensic laboratories influenced by the particular factors so for this reason blocking digital rhetorical laboratories in the future [3]. Among the right estimation of faces on own-age bias there are 114 participants were extra corrected to estimate the particular ages within their particular age among in an age-group (10-15, 21-31 and 61-75 years old) found [4],[5]. A number of factors such as gender and facial expressions are negatively impacted the accuracy of human age estimation. The highest accuracy results in neutral expression but less accuracy results in other expression [6], [7].

The victim age is difficult to figure out in extreme cases like Child Abuse Material (CAM), in these cases in era where plenty of digital investigators wasted time in processing like this cases. Soft biometric of age attribute is hard to predict because of variation between face and body choices,

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Home Security against Human Intrusion using Raspberry Pi

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Abstract

Technology has changed the world. There is a huge growth in technology connected to almost every field. The pace and diversity of advancement is very rapid. Hence, new technology and techniques are coming up and are put to use as per the need. In such advanced scenario, providing security to home has also become a major point of concern. Presently security cameras can be used for the same. But such cameras may be visible to intruders and there is possibility that cameras may be damaged. Hence, in order to serve the purpose, there is a need to find an alternative secure, accurate and quick method. Hence, an effort is made in this paper to design a home security system using Raspberry Pi. System requires Raspberry Pi, Camera, Touch screen and android mobile as hardware components. Python, Node.js and OpenCV libraries are used for software coding. Usually most of the intrusion detection systems click the photo of intruders as soon as the human is detected. But, such systems fail to click photos, so that the intruder can be identified (Face View Photo) and visible. In proposed system, a proper illustrative method is proposed so that the intrusion detection is accurate and photos thus captured are clear, so that intruder is clearly visible. The proposed system is designed as a smart mirror which will provide both information and home security. The system is developed to accept touch and mobile commands. As soon as the intrusion is detected, an alert message along with the identifiable and clear photo (Face view) of intruder will be sent to the owner's/administrator's mobile. The mirror owner can also see the video of deployed environment through the camera fitted on smart mirror.

Keywords: Smart Mirror; Home Security; Intrusion Detection; Raspberry Pi; Frontal Face Detection ;

1. Introduction

The comfort zone of human beings is increasing, as the facilities are increasing. With the incorporation of many technologies into day today activities, life has become easier. On the other side, as far as the technologies are concerned, it also creates security related issues. For example, we use ATMs for doing banking transactions, the security of device and the working accuracy of device matters a lot. Similarly, with the advancement in technology, it is evident that skills of thieves, robbers also have increased. Hence, it is a great challenge to design a foolproof system. Usually people make use of security cameras in order to secure home. The cameras record the activities that

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Experimental Investigation of High-Strength Self-Compacting Fibre-Reinforced Concrete

Aijaz Zende and R. B. Khadiranaikar

Abstract The improvement and development of new techniques in material science are progressively rapid. An experimental programme was conducted to assess the influence of addition of steel fibres to self-compacting concrete (SCC). The aim of present experimental work is to study the effect of superplasticizer and steel fibres on the properties of fresh and hardened SCC. Based on the properties of constituent materials, various trials mixes were produced by varying material proportions, w/c ratio and superplasticizer dosage. An optimum mix design satisfying all requirements of SCC was obtained. Steel fibres of varying percentages from 0 to 5% were added to optimum mix to carry out study on the properties of fresh and hardened SCC. Slump flow, *V*-funnel and *L*-Box tests were conducted to study the properties of fresh SCC. Cubes and cylinders were cast cured for 28 days and tested for compressive strength and split tensile strength to study the properties of hardened SCC. The results obtained indicate a direct impact of dosage of superplasticizer and percentage content of fibres on the properties of fresh and hardened SCC.

Keywords Self-compacting · High strength · Steel fibres · Silica fume

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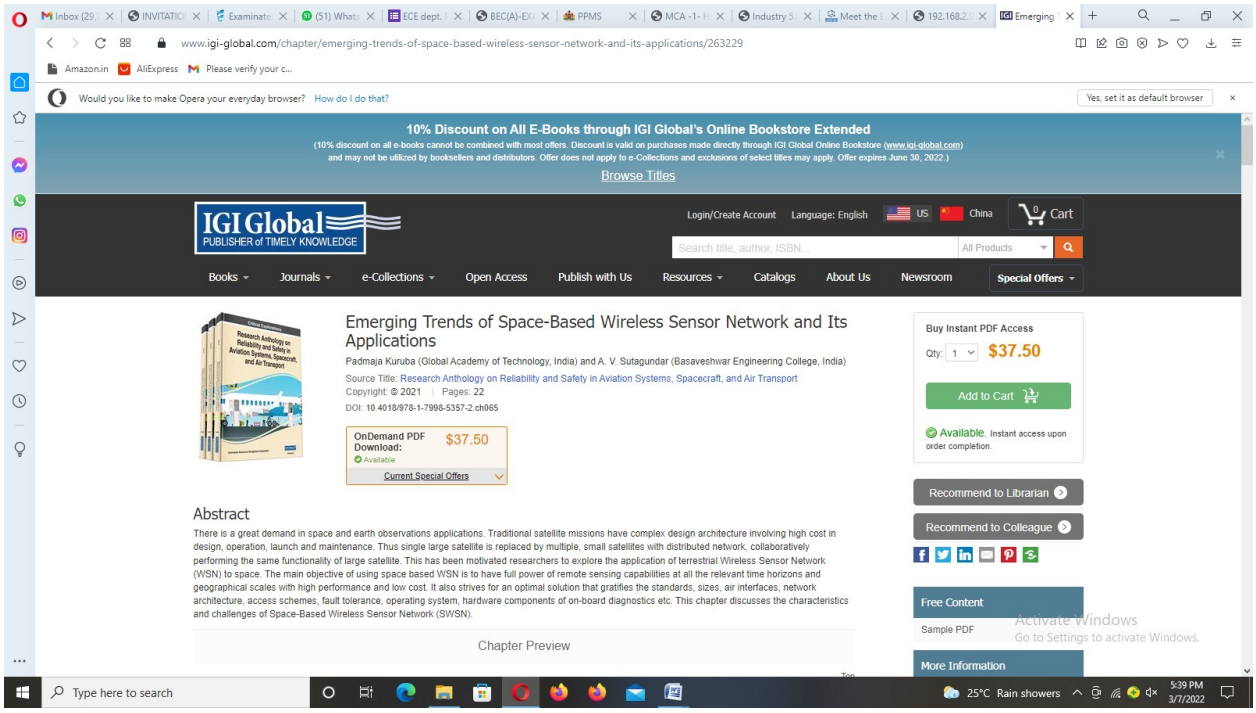
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Abstract
There is a great demand in space and earth observations applications. Traditional satellite missions have complex design architecture involving high cost in design, operation, launch and maintenance. Thus single large satellite is replaced by multiple, small satellites with distributed network, collaboratively performing the same functionality of large satellite. This has been motivated researchers to explore the application of terrestrial Wireless Sensor Network (WSN) to space. The main objective of using space based WSN is to have full power of remote sensing capabilities at all the relevant time horizons and geographical scales with high performance and low cost. It also strives for an optimal solution that gratifies the standards, sizes, air interfaces, network architecture, access schemes, fault tolerance, operating system, hardware components of on-board diagnostics etc. This chapter discusses the characteristics and challenges of Space-Based Wireless Sensor Network (SWSN).
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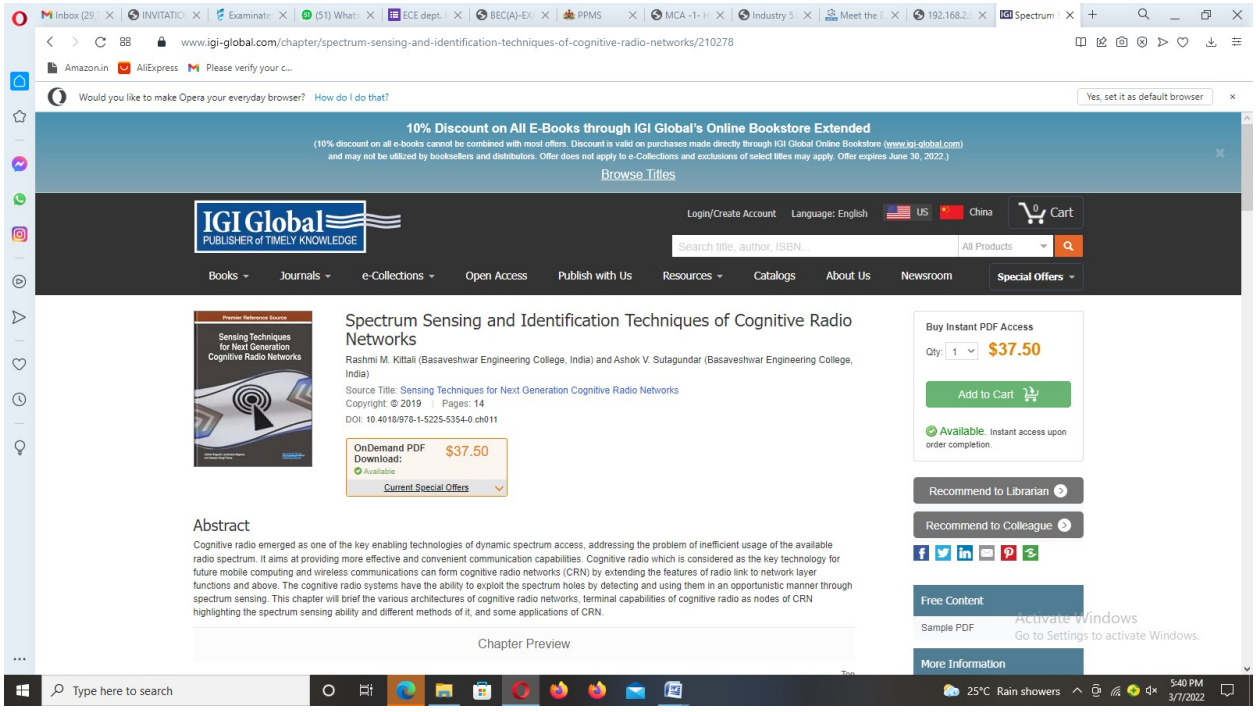
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Spectrum Sensing and Identification Techniques of Cognitive Radio Networks
Rashmi M. Kittali (Basaveshwar Engineering College, India) and Ashok V. Sutagundar (Basaveshwar Engineering College, India)
Source Title: Sensing Techniques for Next Generation Cognitive Radio Networks
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Abstract
Cognitive radio emerged as one of the key enabling technologies of dynamic spectrum access, addressing the problem of inefficient usage of the available radio spectrum. It aims at providing more effective and convenient communication capabilities. Cognitive radio which is considered as the key technology for future mobile computing and wireless communications can form cognitive radio networks (CRN) by extending the features of radio link to network layer functions and above. The cognitive radio systems have the ability to exploit the spectrum holes by detecting and using them in an opportunistic manner through spectrum sensing. This chapter will brief the various architectures of cognitive radio networks, terminal capabilities of cognitive radio as nodes of CRN highlighting the spectrum sensing ability and different methods of it, and some applications of CRN.
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Congestion Control in Cloud Computing Network for Load balancing using Portability

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***Abstract*— The major obstacles in cloud usage is its non-flexible attribute with respect to *portability* of applications and *congestion* due to enormous usage of cloud applications by users. Customers of cloud computing are unable to access the services offered by one cloud over the other. Applications running on one cloud environment is bound to the ordinance and principles of provisioning of the same. The customers we are referring here are mobile in nature. The non-flexible attribute we are referring here is cloud vendor lock-in. We have proposed a new scheme called Cloud Application Migration Management Model (CAM3) that encompasses service *Cloning* for flexible and versatile usage. In this scheme, we plan to clone the application proffered by cloud vendor and install in another homogeneous hybrid cloud environment. The service application migrated can be made accessible by *Application Re-engineering* and *Code Re-factoring* techniques, thus making the cloud environment elastic and versatile.**

Keywords*— *Cloud Computing, Portability, Cloning

I. INTRODUCTION

Over the past decade, cloud computing technology has flared-up as an auspicious model with the principles of coherent and multi-occupant serving nature. With its widespread service spectrum stack, provisioning propensity and pay-per-use themes, it has positioned itself among the top five valuable as well as cost-effective service delivering technologies of the present IT market. Cloud computing can be illustrated as a multi-dimensional offering cum computing services delivery model, where in necessary resources are provisioned to the customers over the internet with guaranteed Quality of Service (QoS). The diverse computing services offered by the cloud stack encompass on-demand self-utility, offhand maintenance, large-scale network accessibility, swift pliability to dynamic needs, adequacy with respect to systematic measuring of customer usage and much more. The reckon services and resources will be conveyed to the users based on the concept of virtualization. Virtualized service/resources include hypervisors, virtual machines/containers, storage, network, service platform, application specific processing and computing software's.

Although cloud technology provides sophisticated, cost-effective services to its customers and has as a compelling impact on the present IT industry. However, lags with scarcity of open artefacts between homogeneous cloud providers. Standardization with respect to complete cloud service spectrum is a challenging task, as different providers have dissimilar compositions, costs, principles and domains. Vendor lock-in is considered as one of the gigantic threat and defiance for both the customers who are inside the cloud and who want to enter into another cloud. The lock-in problem further leads to the rise of portability and migration overheads. Cloud portability and migration is a barrier caused by cloud providers holding proprietorship with respect to APIs, platforms, versions, database schemas.

In this paper we analyze the vendor lock-in obstacle with respect to migration and portability of homogeneous cloud artifacts between different cloud environments and vendors. Further we plan to resolve the same by cloud application cloning, software re-engineering and re-factoring techniques. First, we present a cloud computing portability framework which exhibits an all angle possible migration scenarios. Second, we introduce CAM3 (Cloud Application Mobility Management Model) which can be extensively employed in order to achieve application mobility across multiple cloud eco-systems with minimum effort. CAM3 is unification of modules namely application cloning, transmission, application re-engineering and installing techniques. Finally, to establish credibility of the proposed scheme, we carry out application re-factoring and analysis of the same with respect to parameters and metrics of performance.

Proceeding segments of this paper is organized as follows: Section II describes the previous work carried out to solve cloud portability, migration and vendor lock-in problems. Further, various open standard models, scenarios, porting semantics are systematically analyzed. Section III presents a framework for cloud portability semantics. In section IV, we introduce CAM3 to overcome application migration with minimal effort. Section V presents the results and analysis on the same. Lastly, Section VI explains contribution and future direction to the work.

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Optimization of Parking Dynamics in Smart City using Cloud Networks

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***Abstract*—The modern India is proposing and developing smart cities, so that Indian standard of living to grow and reach on par with other countries. The smart cities should be embedded with all new technologies such as sensors, environmental, cloud access, IoT interface, data acquisition, etc. In our proposed work, we are planning to interface cloud with a smart city traffic management. In metro cities people go to cluster area such as Temples, Shopping malls, Cine theatres, etc and waste time in searching parking lots and withdrawing themselves with no solutions. We have come up with the concept that uses smart dynamic parking provision mechanism that can be accessed before the hand at target place or nearby sub parking possibilities. This solution reduces traffic turbulence and pleasure of utilizing possible parking lots as alternate solution rather than withdrawal.**

***Index Terms*—VCCN, Public Cloud, Traffic overcrowding, Dynamic Provision**

I. Introduction

The rapid growth of infrastructure and modernization has lead to the development of sophisticated modern information and communication technologies, living standards of people can be enhanced according to the vision of smart city development schemes such as automation of smart vehicle parking plays a requisite role in daily routine life which can be done through collaborating cloud with vehicle networks to give rise to a concept Vehicle Cloud Computing Networks (VCCN). The vision of smart city is an ingenious concept that uses recently emerged information and communication technologies to enlighten all spheres of metro life. To make the effectiveness of such an ingenious concept is through implementation, several concepts and technologies are proposed and engulfed to enhance the perceptive of overcoming the complex challenges such as traffic overcrowding, autonomous traffic management, smart parking system, one can migrate to cloud computing to avail the intellectual cloud assisted services and can establish the dynamicity of provisioning resources ranging from traditional servers to hosted cloud solutions to the dormant computational potential of edge devices. Number of motor vehicles and private cars are drastically increasing and parking spaces are gradually increasing and everybody wants to enjoy with family by moving out in their vehicles at unknown places and searching for parking becomes a natural issue mainly in Indian metropolitan cities like Mumbai, Kolkata, Bengaluru etc. conventional parking lots are accessed by searching and it availability depends on luck and sometimes end up parking on road side. Overcoming these issues has become a challenging job to cope up with demands and needs to acquire parking lot especially in a densely populated areas , one paperback solution to such a problem is by acquiring the parking availability through cloud assisted multiple cluster areas interrogation by vehicles in a desired location, where within a span of 2Km range one can find the shortest distance with minimum time reach path to the targeted cluster space nearby destination.

II. LITERATURE REVIEW

P.Harris et al. [1] deliberates about reservation based Smart parking availability by checking the availability in a single parking lot at a desired location by evaluating the number of free slots efficiently through sensors and aurdino kits as local units to communicate to the cloud environment. But does not take it to an account to contact multiple parking lots in a given desired area for availability. The real problem of traffic overcrowding can be resolved dynamically and probability of availing the parking increases by considering multiple parking lots in a desired area.

M. Hemalatha et al. [2] deliberates about intelligent parking system using vehicular cloud services and proposes a scenario of all vehicles communicating to RSUs and these are further synchronized with cloud and through an android app it confirms about vacancy of slots in a parking lot but this system works for single parking lots and lacks the dynamicity of providing the availability of the parking resource before the hand in a location with more probability. M. Siam et al. [3] demonstrates the FPGA based parking management system with three constituents mainly camera, database management and user interface it implements with the help of camera for capturing vacant parking spaces, with and uses deep neural

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Design and Simulation of Carbon Nanotube based Piezoresistive Pressure Sensor for Patient Monitoring Application

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Abstract- The aim of this paper is to design a high sensitive piezoresistive pressure sensor for sensing a pressure in the range of 1 Pa to 1 MPa (required for patient monitoring application). The design of proposed sensor using piezoresistive mechanism includes piezoresistors that are made of carbon nanotube. When the input pressure is applied on the diaphragm, a subsequent deformation occurs which in turn changes the dimension of the piezoresistors that are configured in Wheatstone bridge format resulting in change of resistance of the carbon nanotubes. The basic principle of carbon nanotube based piezoresistive pressure sensor is the measurement of change in the resistance across the carbon nanotubes due to pressure applied. A contact is established between the nanotubes and the platinum electrodes, thus measuring the resistance of the nanostructures. The proposed model is analysed by considering various parameters such as deflection of the diaphragm, change in the output voltage across the bridge, sensitivity, etc.

Keywords- Pressure Sensor, Piezoresistor, Carbon Nanotube (CNT), Wheatstone bridge, Gauge factor.

1. INTRODUCTION

Pressure sensor of the dimensions of microns referred to as MEMS pressure sensor is a device that measures pressure, ordinarily of gasses or fluids. Any pressure sensor consists of a sensing element such as diaphragm which converts applied pressure into a suitable physical movement. A sensing element is followed by a suitable transducer that converts mechanical movement of sensing element into a readable electrical signal. Based on the transduction mechanism employed, pressure sensors can be classified as capacitive, resonant, piezoelectric, thermal, piezoresistive, etc. In this paper, piezoresistive transduction mechanism is employed due to the fact that it has mature fabrication process, linear operation over wide range of pressure, simple read out circuitry, and it can be made highly sensitive.

In a piezoresistive pressure sensor, the piezoresistive effect is a change in the electrical conductivity (resistivity) of a piezoresistive material when mechanical strain is applied. Almost all semiconductors and metals can be used as piezoresistive materials; however semiconductors are more preferred over the metals, since semiconductors exhibit higher gauge factor. Widely used materials that are used as piezoresistive materials are metal foil (1 to 5), thin film metals (2), diffused semiconductors (80 to 200), polysilicon (30), polycrystalline SiC (3 to 5), single crystal silicon carbide (10 to 30), carbon nanotubes (200 to 1000), etc. It can be seen that CNT show a very high gauge factor of up to 1000 which recently led to research that uses CNT as piezoresistive element instead of silicon. Hence in this paper, semiconducting multiwalled carbon nanotube (MWNT) bundle is used as piezoresistive material. The advantage of MWNT bundles is the ease with which they can be formed across the electrodes on top of diaphragm.

Carbon nanotube is a tube-shaped material, composed of carbon atoms linked in hexagonal shapes, with each carbon atom covalently bonded to three other neighbouring carbon atoms. It exhibits excellent mechanical and electrical properties such as 200 times the strength and 5 times the elasticity of steel, 5 times the electrical conductivity, 15 times the thermal conductivity and 1,000 times the current capacity of copper, half the density of aluminium and it has a tensile strength of 63 GPa. The resistance of a CNT [1] is given by

$$R = R_c + \frac{1}{|t|^2}\frac{h}{8e^2}\left[1 + exp\left(\frac{E^0_{Gap} + \frac{dE_{Gap}}{d\varepsilon}\varepsilon}{kT}\right)\right] \qquad (1.1)$$

where $|t|^2$ is the transmission probability of electrons with $|E-E_F| > E_{Gap}$ crossing the energy barrier, Rc is the contact resistance, h is plank's constant, e is the charge on an electron, k is Boltzmann's constant, and T is temperature in degree Kelvin. The Gauge factor of a structure is defined as the change in resistance to the amount of volumetric strain acting on it and is given by

$$GF = \frac{\frac{dE_{Gap}}{d\varepsilon}\exp\left(\frac{E^0_{Gap} + \frac{dE_{Gap}}{d\varepsilon}\varepsilon}{kT}\right)}{kT\left[\exp\left(\frac{E^0_{Gap} + \frac{dE_{Gap}}{d\varepsilon}\varepsilon}{kT}\right) + 1\right]} \qquad (1.2)$$

From the above equations it can be concluded that, as the strain applied increases, the band gap increases. Similarly as

Hybrid Algorithm for Data Confidentiality in Internet of Things

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***Abstract*—Internet of Things (IoT) is a network of globally connected physical objects, which are associated with each other via Internet. The IoT foresees the interconnection of few trillions of intelligent objects around us this interconnection produce large amount of private information which needs to be processed, transferred and stored. So to provide security and privacy to this information in IoT is a very challenging task, which is to be concerned at highest priority for several current and future applications. Devices such as smart phone, WSNs and RFIDs etc., are the major components of IoT network which are basically resource constrained devices. Design and development of security and privacy management schemes for these devices are guided by factors like good performance, low power consumption, robustness to attacks, tampering of the data and end to end security. Security schemes in IoT provide unauthorized access to information or other objects by protecting against alterations or destruction. In this paper, we propose hybrid confidentiality algorithm which is a combination of Advanced Encryption Standard (AES), Elliptic Curve Cryptography (ECC) and Message-Digest algorithm (MD5) algorithms. Geo encryption or location based encryption is also integrated with hybrid algorithm to give confidentiality to every devices. The hybrid algorithm enables strong confidentiality on the data transmission for Internet of things. Our proposed algorithm exhibits better performance in terms of encryption time, decryption time w.r.t. various file sizes.**

***Index Terms*—Internet of Things (IoT), Confidentiality, Advanced Encryption Standard, Elliptic Curve Cryptography, Message-Digest algorithm**

I. Introduction

The IoT is a global network infrastructure, linking physical and virtual things through the exploitation of data capture and communication capabilities. The IoT infrastructure includes existing Internet and other network elements. IoT devices are characterized by a high degree of autonomous data capture, event transfer, network connectivity and interoperability for the independent cooperative services and applications. The all IoT context consist of billions of individuals, individual devices, and services that can interlink to exchange information and other useful information is described [1].

With the rapid increase in Internet and network based applications a huge amount of data is generated were several security and privacy issues are observed. Every object in such network will create security flaws and privacy weakness, these limitations are exploited by hackers, and in a statistical sense all these flaws and weaknesses may be abused in an environment with billions of devices [2]. However, in the absence of solid security in place, attacks and malfunctions in the IoT may outweigh any of its benefits [3]. Security and privacy which is responsible for some issues like confidentiality, authentication, validation, non-repudiation and integration. So all IoT devices support strong security intelligence for encryption and decryption of confidential data.

Confidentiality is one major challenge of security and privacy and it protects information from wrong people. Traditional confidentiality algorithms exhibit many challenges for this task. For IoT confidentiality, solutions should deal with high scalability requirements, heterogeneity of the involved building blocks, in addition to resources scarcity of the embedded devices such as energy and computational limitations. In this paper, we propose secured hybrid confidentiality algorithm that integrates AES, ECC and MD5 algorithms.

Rest of this paper is organized as follows. Related works are given in section II. Proposed work is presented in section III. Simulation and result analysis are discussed in section IV. Section V Concludes our paper.

II. Related Works

IoT allow people and things to be connected i.e. anything, anyone, any-where and anytime. In very short period Internet has turned into more common in our life than any other technology in the history, it has revolutionized the communication way of people. This will be through the usage of unique Internet protocol that permits things for communicating to each other without human intervention [4]. The evolution and importance of IoT in daily life and its architecture, protocols, numerous possible applications are described in [5].

The different security and protection attacks are discussed in [6]. Different IoT layer architectures to analyze the security problems of each layer and try to get new solutions. And also analyzes the cross-layer mixed integration challenges and security challenges are discussed in [7]. The framework of IoT and the security hazards in IoT, and new multi-layer security display is proposed [8]. The existing research on network security and Internet technology, and new approaches for analysts in certain IoT application and its related security are discussed in [9].

The lightweight implementation and evaluation of Elliptic Curve Cryptography (ECC) algorithm information is presented

Trust and Delay based Routing for VANETs

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***Abstract*—Vehicular Ad Hoc Networks (VANET) is mainly aimed at providing safe and security related information and traffic management. In future, VANET contribute to smart transportation system. In routing, trust between the vehicles plays an important role to forward safety related information. This paper aims at design of trust based minimum delay routing for Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) communication under the VANET constraints like rapid change in topology, high dense network, link failures etc. The algorithm works as follows: 1) trust calculation: using the prior knowledge about the neighbors, determine trust between the source node and its neighbors, 2) route selection: select the node with higher trust value, 3) minimum message reachable time (MMRT) calculation: find the MMRT for all selected paths,and 4) route decision: select the path with high trust and minimum delay. The proposed scheme exhibits better packet delivery ratio and decreased end-to-end delay. The results show that our work is better and has only trusted vehicles participation in the routing with minimum delay.**

***Index Terms*—Vehicular Ad hoc Network (VANET); Trust; Delay; Vehicle-to-Vehicle Communication (V2V); Vehicle-to-Infrastructure Communication (V2I)**

I. Introduction

A VANET is an emerging technology with vehicles equipped with a communication device called on-board unit (OBU), and a set of stationary units along the road, referred to as road side units (RSUs) which act as a gateway for connectivity to other communication networks, such as the Internet. Each vehicle OBU has a wireless network interface which allows the vehicle to directly connect to other vehicles and RSUs within its communication range, as well as wireless or wired interfaces to which application units can be attached. By employing Vehicle-to-Vehicle (V2V) and vehicle-to-RSU (V2R) communications, VANETs can support a wide variety of applications in road safety, passenger infotainment, and vehicle traffic optimization which is the main reason that VANETs have received significant support from government, academia, and industrial organizations over the globe. Due to features like high mobility [1] rapid changes in the network takes place which leads to many challenges in VANET like Data Aggregation, Clustering, Data validation, Data Dissemination, Routing, Security [2]. In this paper design of delay aware trust based routing for Vehicle to Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) communication under the VANET constraints like dynamic topology, unpredictable vehicles density, link failures etc., to maximize the network performance parameter like packet delivery ratio, bandwidth utilization, throughput and to minimize end-to-end delay, control overhead is proposed.

The proposed delay aware trust based routing scheme works as follows: (1) trust calculation: using the prior knowledge about the neighbors, determine trust between the source node and its neighbors 2) route selection: select the node with higher trust value 3) minimum message reachable time (MMRT) calculation: find the MMRT for all selected paths 4) route decision: select the path with high trust and minimum delay.

The remaining part of the paper is summarized as follows: Details about the literature survey is given in section 2. Section 3 proposes details of proposed work where trust based routing in VANET for V2V and V2I communication is done. Simulation inputs and simulation procedure are presented in Section 4. Simulation results are discussed in Section 5.

II. Related Works

Proactive and reactive routing algorithms for VANETs with different mobility models and network scenario are presented in [3] - [7]. In [8] - [11], routing protocols using intelligent techniques such as fuzzy logic, norm-aware agents, game theory, etc., are proposed to improve delay, packet delivery ratio, security, throughput for high dense environment. In [12], survey of different techniques to improve secure routing with trust enhancement among vehicles in VANETs is proposed. Trusted and secured routing protocol named as Trusted Vehicular Ad-hoc On-demand Distance Vector (TVAODV) is explained in [13]. A secure group authentication technique for VANET is proposed in [14].

The routing protocol based on trustworthiness of the path and the number of hops to identify the optimal route for transmitting reliable information is proposed in [15] - [16]. Due to selfishness some vehicles exhibit various misbehavior such as dropping packets which degrade the efficiency of network. Hence it is important to stop such vehicles to participate in network communication by proposing an effective revocation scheme for disconnected Delay Tolerant VANETs [17]. Considering the real time traffic conditions in case of link connection and historical traffic condition in case of link disconnection for route selection precess is explained in [18].

To decrease the hop count and delay and to increase the network throughput and the packet delivery ratio a new routing protocol based on cost metric is proposed in [19]. In some situations where the target vehicle is moved away from the expected range and in sparse traffic conditions connectivity is

Connectivity and Delay Aware Reliable Routing in Vehicular Ad hoc Networks

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***Abstract*—In Vehicular Ad hoc Networks (VANETs) safety routing of information data packets is challenging issue, due to their delay-sensitive nature. The paper aims to resolve the issue of reliable and minimal delay routing in VANET. We propose a routing scheme to identify the reliable route with minimum delay from source to destination in VANETs. The routing scheme is in terms of probabilistic analysis of link duration between source and destination vehicles using border-node based most forward progress mechanism. Also the routing scheme selects best next hop vehicle out of the available neighboring vehicles belonging to source vehicle communication range border area. As the delay aware reliable routing is dynamic in nature handles the sparse and dense VANET scenarios to maximize the packet reception at the destination node. To examine the performance efficiency of the proposed work the performance parameters such as packet delivery ratio, latency and End-to-End delay are simulated and analyzed.**

***Index Terms*—Vehicular Ad hoc Network (VANET); Routing; Connectivity and Delay aware routing**

I. Introduction

With pervasiveness of mobile computing technology, Vehicular Ad hoc Network (VANET) is a basic networking concept for the future vehicular communications. In VANETs, the communication takes place from vehicle to vehicle, vehicle to fixed Road Side Units (RSUs) to propagate different applications like monitoring of surrounding roads, planning the route,traffic information, vehicle crash intimation, internet access, digital map downloading, e-commerce, co-operative driver assistance entertainment in vehicles, parking availability, user interactions etc. [1]-[6].

With respect to Media Access Control (MAC), several VANET issues arises which includes information management, routing, network management, congestion and collision control, maximum message dissemination, privacy and security [7]. On account of the high speed of vehicles and fast changes in network topology, construction of a reliable routing protocol to transfer the message with negligible delay is thought to be a critical issue in VANET.

The method of finding optimal path between source and destination vehicle with minimum overhead to disseminate data is called as routing. Nowadays researches on path finding protocols depending on position of vehicle have become important because of improved network connectivity for road selection. In such protocols sending of data takes place directly between source vehicle and destination vehicle or through vehicles between source and destination and through roadside units [8].

Many research works have been proposed for the implementation and improvement of the VANET routing mechanism. Few ongoing related research works are given as follows. Analysis of path duration for VANETs is discussed in [9]. The density function of probability is estimated to calculate path duration for more number of intermediate nodes using exponential distribution function. The parameters like velocity of the moving vehicle, signal broadcasting range and number of vehicles between the transmitting vehicle and receiving vehicle are considered in calculation of path duration. Route lifetime and link stability are analyzed in [10] for the decentralized type of wireless networks. Edge Effect event happening in denser VANET is also given. A routing scheme explained in research work [11] uses an on demand reactive routing algorithm to decrease the duration for path calculation and also computes an alternate path if route failure occurs.

In [12], authors present that the number of intermediate vehicles and development in intermediate vehicles is depending on density of the vehicle and distance between vehicles. Routing protocols based on position or location of vehicles like Border-node based Most Forward progress within Radius routing (B-MFR) [13] and Edge-node based Directional Routing (E-DIR) [14] are used to choose the best next node for transmission of packets and are also used for evaluating the path duration in VANETs.

Bio-inspired routing algorithm [15] uses ant colony optimization method to find solutions for vehicle routing problem. This helps to avoid congestion whenever an accident happens. The surrounding road scenario that is represented by an undirected graph is given in Reliable Inter-Vehicular Routing (RIVER) where the graph vertices represents the points where curve in street takes place, and the street sections are represented by edges of the graph [16].

The proposed routing scheme identifies reliable route with minimum delay from source to destination in VANETs. Probabilistic analysis approach is provided for link duration between source and destination vehicles using border-node based most forward progress mechanism. Also the routing scheme selects best next hop vehicle out of the available neighboring vehicles belonging to the border area of the source vehicle transmission range. Proposed delay aware reliable routing scheme is

Multi-agent based stable clustering in VANET

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2 Author(s) Anita Bavalatti ; Ashok V. Sutagundar **View All Authors**

Abstract: Vehicular Ad-hoc Network (VANET) is part of Mobile Ad-hoc Network (MANET) that facilitates communication between group of vehicles to provide driver safety, traffic updat... **View more**

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Abstract:
Vehicular Ad-hoc Network (VANET) is part of Mobile Ad-hoc Network (MANET) that facilitates communication between group of vehicles to provide driver safety, traffic updates, entertainment, data sharing etc. Clustering is an efficient method to handle the frequent change in the topology of VANET by means of local co-ordination. We present multi agent based stable clustering to provide stability, which in turn enhance the cluster life time. Proposed approach make use of multi-agent interaction method consists of static and mobile agents to establish the communication between vehicles and RSU. RSU agent responsible to decide the cluster size and select the suitable cluster head based on vehicle speed and connectivity with neighboring nodes. Here we vary the cluster size depending upon vehicle speed, which in turn increases the cluster life time and reduces the routing overhead. After formation of cluster maintenance of cluster is hand over to cluster head agent. The proposed method is simulated in NS2 by considering some of the performance parameters such as vehicle speed, node density, cluster formation time, cluster head selection time, communication range etc.

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Congestion controlled adaptive routing in wireless sensor network

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3 Author(s) Rashmi M. Kittali ; S. K. Mahabaleshwar ; A. V. Sutagundar **View All Authors**

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Abstract:
Control of congestion in case of wireless sensor networks (WSNs) is a very crucial area of interest, where an increase in data transmission by sensor nodes results in a proportionately smaller increase, or even a reduction in throughput. Therefore, more sophisticated techniques are required to combat with network congestion. Various constrained resources of the WSN are to be taken into account while devising such mechanisms. Different approaches for congestion detection and avoidance have been introduced in the past few years. The traditional flooding and gossiping algorithm can cause loss of data. To tackle some of the issues, this paper presents a novel approach for congestion control based dynamic routing. In the proposed work, whenever the packet traversal experiences the congestion, an alternate path is computed to reroute the packets on the new path. The proposed work has three phases namely congestion detection, alternate path computation and re-routing the packets on new path. Congestion in the path can be detected based on the free space available in the buffer. Alternate path is computed based on available bandwidth, hop distance and residual energy on the path. This work is simulated using C for its effectiveness. Some of the performance parameters considered in this work are route discovery time, congestion ratio, delay etc.

Published in: 2016 International Conference on Signal Processing, Communication, Power and Embedded System (SCOPES)

Hybrid Algorithm for Data Confidentiality in Internet of Things

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***Abstract*—Internet of Things (IoT) is a network of globally connected physical objects, which are associated with each other via Internet. The IoT foresees the interconnection of few trillions of intelligent objects around us this interconnection produce large amount of private information which needs to be processed, transferred and stored. So to provide security and privacy to this information in IoT is a very challenging task, which is to be concerned at highest priority for several current and future applications. Devices such as smart phone, WSNs and RFIDs etc., are the major components of IoT network which are basically resource constrained devices. Design and development of security and privacy management schemes for these devices are guided by factors like good performance, low power consumption, robustness to attacks, tampering of the data and end to end security. Security schemes in IoT provide unauthorized access to information or other objects by protecting against alterations or destruction. In this paper, we propose hybrid confidentiality algorithm which is a combination of Advanced Encryption Standard (AES), Elliptic Curve Cryptography (ECC) and Message-Digest algorithm (MD5) algorithms. Geo encryption or location based encryption is also integrated with hybrid algorithm to give confidentiality to every devices. The hybrid algorithm enables strong confidentiality on the data transmission for Internet of things. Our proposed algorithm exhibits better performance in terms of encryption time, decryption time w.r.t. various file sizes.**

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The lightweight implementation and evaluation of Elliptic Curve Cryptography (ECC) algorithm information is presented

Chapter 4
An Experimental Study on Benzo[a] Pyrene Concentration in Particulate Matter at Industrial Area of Bangalore

Prashant Basavaraj Bhagawati, Satish G. Muttagi, Poorna B. Bhagawati, Sandip S. Sathe and Abhijit M. Zende

Abstract Assessment of benzo[a]pyrene concentrations, with particularly preferred metals in polluted air, is significant issue for estimating counter health effects. Polycyclic aromatic hydrocarbons (PAHs) recognized one of the major crucial toxic air pollutants in industrials cum urban regions. With partial combustion of organic materials such as motor oils, gasoline, tobacco, cooking oils, butter, and other food leads to the formation of PAHs. With considering the importance of tracing the concentration of PAHs the experimental analysis work is carried out, to recognize the adverse effect on atmosphere. The air samples were collected (as 24 h sample once in a month) from eight specific spots within Peenya industrial monitored network Bangalore, India. The qualitative and quantitative analysis tests were carried out with modern scientific instrumental tool GC-MS. The concentration of B[a]P in eight measuring locations ranged from below detectable limit (BDL) to 0.0490 ng/m^3. From the results obtained, there was noticeable variation in B[a]P concentration, with respect to measuring locations.

Keywords Polycyclic aromatic hydrocarbons · benzo[a]pyrene · Particulate matter

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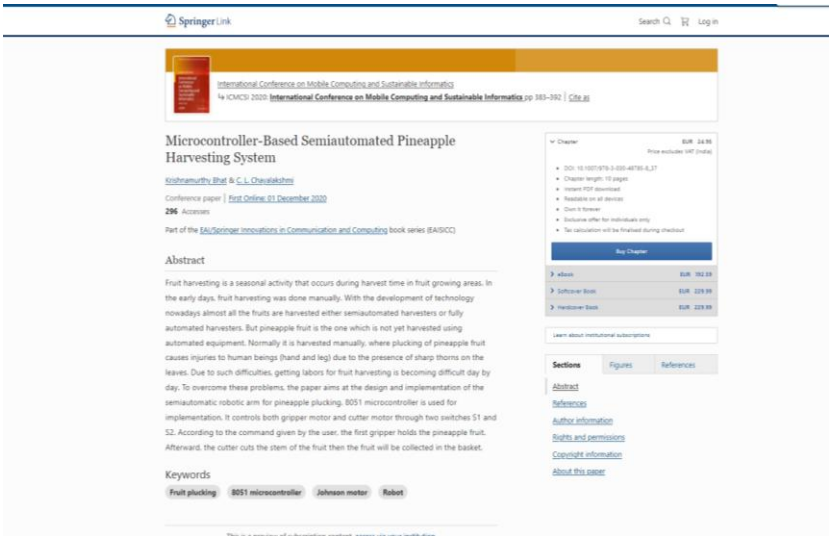

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Microcontroller-Based Semiautomated Pineapple Harvesting System

Krishnamurthy Bhat & C. L. Chayalakshmi

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Abstract

Fruit harvesting is a seasonal activity that occurs during harvest time in fruit growing areas. In the early days, fruit harvesting was done manually. With the development of technology nowadays almost all the fruits are harvested either semiautomated harvesters or fully automated harvesters. But pineapple fruit is the one which is not yet harvested using automated equipment. Normally it is harvested manually, where plucking of pineapple fruit causes injuries to human beings (hand and leg) due to the presence of sharp thorns on the leaves. Due to such difficulties, getting labors for fruit harvesting is becoming difficult day by day. To overcome these problems, the paper aims at the design and implementation of the semiautomatic robotic arm for pineapple plucking. 8051 microcontroller is used for implementation. It controls both gripper motor and cutter motor through two switches S1 and S2. According to the command given by the user, the first gripper holds the pineapple fruit. Afterward, the cutter cuts the stem of the fruit then the fruit will be collected in the basket.

Keywords

Fruit plucking | 8051 microcontroller | Johnson motor | Robot

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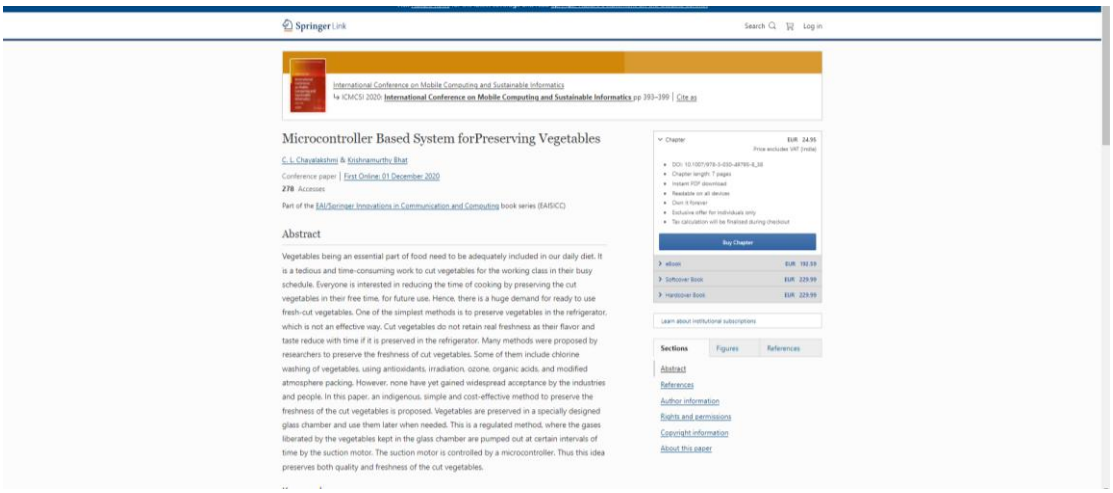

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Microcontroller Based System forPreserving Vegetables

C. L. Chayalakshmi & Krishnamurthy Bhat

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Abstract

Vegetables being an essential part of food need to be adequately included in our daily diet. It is a tedious and time-consuming work to cut vegetables for the working class in their busy schedule. Everyone is interested in reducing the time of cooking by preserving the cut vegetables in their free time, for future use. Hence, there is a huge demand for ready to use fresh-cut vegetables. One of the simplest methods is to preserve vegetables in the refrigerator, which is not an effective way. Cut vegetables do not retain real freshness as their flavor and taste reduce with time if it is preserved in the refrigerator. Many methods were proposed by researchers to preserve the freshness of cut vegetables. Some of them include chlorine washing of vegetables, using antioxidants, irradiation, ozone, organic acids, and modified atmosphere packing. However, none have yet gained widespread acceptance by the industries and people. In this paper, an indigenous, simple and cost-effective method to preserve the freshness of the cut vegetables is proposed. Vegetables are preserved in a specially designed glass chamber and use them later when needed. This is a regulated method, where the gases liberated by the vegetables kept in the glass chamber are pumped out at certain intervals of time by the suction motor. The suction motor is controlled by a microcontroller. Thus this idea preserves both quality and freshness of the cut vegetables.

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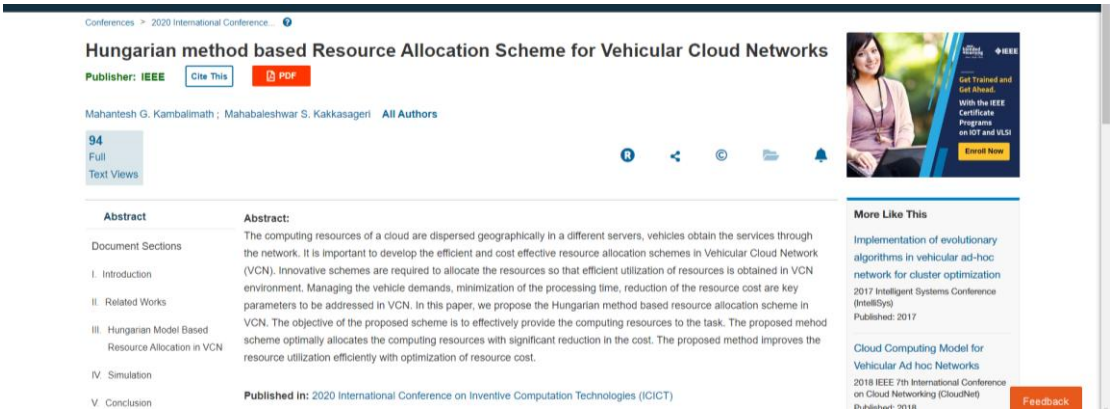

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Hungarian method based Resource Allocation Scheme for Vehicular Cloud Networks

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Mahantesh G. Kambalimath ; Mahabaleshwar S. Kakkasageri All Authors

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Abstract

Document Sections

I. Introduction

II. Related Works

III. Hungarian Model Based Resource Allocation in VCN

IV. Simulation

V. Conclusion

Abstract:

The computing resources of a cloud are dispersed geographically in a different servers, vehicles obtain the services through the network. It is important to develop the efficient and cost effective resource allocation schemes in Vehicular Cloud Network (VCN). Innovative schemes are required to allocate the resources so that efficient utilization of resources is obtained in VCN environment. Managing the vehicle demands, minimization of the processing time, reduction of the resource cost are key parameters to be addressed in VCN. In this paper, we propose the Hungarian method based resource allocation scheme in VCN. The objective of the proposed scheme is to effectively provide the computing resources to the task. The proposed mehod scheme optimally allocates the computing resources with significant reduction in the cost. The proposed method improves the resource utilization efficiently with optimization of resource cost.

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Chapter

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Book ICT for Competitive Strategies

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First Published	2020
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A Framework for image selection for image fusion using crowdsourced data

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Abstract: The proposed method in the paper actions the design an ensemble model based deep learning framework to choose the most relevant images from the crowd-sourced data for efficient image fusion. Image fusion is a technique of combining multiple registered images to get more informative or High Resolution (HR) image. Proposed method makes use of crowdsourcing to obtain multiple images. Crowdsourcing is a process of turning to a body of people to obtain relevant images. The images obtained through crowdsourcing may belong to different classes and may also contain multiple noisy and unwanted images and may be of different orientation. Also, the images obtained through crowdsourcing may be captured from different sources and also they may be in multiple resolution. The proposed method consists of training multiple deep learning models to estimate the probability of the image being relevant independently. Proposed method fuses the independent probabilities obtained from different algorithms using the decision fusion algorithm. Followed by elimination ofredundant images and the images containing significant amount of blur/noise. The selected images are then fused to generate the High Resolution (HR) image.The comparison of the results of proposed algorithms with different state-of-the-art fusion techniques using different qualitative and quantitative techniques yields increased efficiency through the proposed algorithm.

Introduction:

In this paper, the proposed method addresses the problem of image selection with an ensemble model based deep learning framework to choose the most relevant images from the crowd-sourced data for efficient image fusion.The main objective of the image fusion is to combine multiple images of the same scene taken at different instances, from different view-points and/orby different sensors in order to provide more information and semantic interpretation. The spatial and spectral resolution of monocular imaging system limits the information of single image.

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A Survey of Cloud Computing Security Challenges, Issues and their Countermeasures

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***Abstract*—Cloud computing is an emerging paradigm that provides on demand access to various resources such as servers, storage, applications, networking etc., over internet. Cloud computing enables access to shared pool of resources efficiently, which are managed by third party cloud service providers. It comes with wide range of benefits such as low operating cost, efficiency, scalability, flexibility, etc. The cloud users can access different services and/or resources at anytime and from anywhere on pay per use basis. Hence many individual users, organizations, and businesses are moving towards cloud computing and sharing large amount of data on cloud. However, the security concern is the biggest barrier for wide adoption of cloud computing. The security issues exist in context of infrastructure, data and storage, access control in cloud environment. This paper explores various security issues in all these perspectives. The paper briefly reviews the security issues at infrastructure level, data level, and also discusses the concept of Identity and Access Control in cloud. Also the different solutions to avoid or alleviate the security issues in cloud environment are discussed.**

***Keywords*—Cloud computing, Security, Access Control, Privacy, Integrity, Identity Management, Authentication, Authorization**

I. INTRODUCTION

In recent years there is a massive evolution in information technology, which has made information technology an important aspect of all individuals. In todays modern era of computation, which includes mobile computing, Internet of Things, cloud computing etc., a large volume of data is generated. Cloud computing has given an efficient way to process, store, and manage such large amount of data over internet. Cloud Computing provides access to various resources that are scalable and easily available. The different forms of cloud services include computation, applications and services over the Internet [1]. The cloud service provider is responsible to deliver the requested service to the cloud user. With the help of cloud computing, users can access shared resources from anywhere and at anytime without any restriction of space, resources, and cost. Further attractions of cloud computing includes, services that are less costly, scalable, flexible, and elastic. Hence, Cloud computing is trending in todays technology-driven world and organizations of all scales are using cloud computing [2]. According to the survey done almost 96% of IT organizations are adopting cloud technology because of the numerous advantages offered by it [3].

The cloud computing architecture consists of different deployment models and service delivery models. The types of cloud deployment models are public cloud, private cloud and hybrid cloud. The type depends on the environment the cloud is deployed. The public cloud is accessible to every user, as it does take into consideration the affiliation of user to any specific organization. The private cloud is can be used only by members or users of any particular organization. The hybrid cloud presents the mixture where both public and private cloud is available for use. The service delivery models are classified on basis of type of service delivered to users. The classification includes Software as a Service (SaaS), Platform as a Service (PaaS), and Infrastructure as a Service (IaaS). In SaaS, the different software applications are provided as a service to cloud users through internet. The PaaS model delivers different platforms and resources as a service to users over internet, which is required to build applications. IaaS model offers the hardware and necessary infrastructure as a service to cloud users, to facilitate development and deployment of applications. Though cloud computing is booming and its demand is increasing with rapid speed, it comes with its share of security issues. There exists some security concern for cloud computing that need to be addressed. The security concern arises because user loses control over the data as the data is now available in cloud service providers domain. The different applications and users are able to access the users data. It is complete responsibility of cloud service provider to apply proper security measures. Because of the shared and un-trusted environment of cloud computing, some new security violations are introduced. Hence the wide adoption of cloud computing is limited and many users do not completely trust the cloud computing environment [4-5]. In this paper the most promising challenges for cloud computing and the security issues at different levels are presented. The major focus is given to infrastructure security, data security and access control. The possible countermeasures for the security issues are also discussed in the respective sections.

The rest of the paper is organized as, the Section II describes the security challenges present in cloud computing, which are listed by Cloud Security Alliance. In Section III the different security issues and possible solutions are described. The overview of trust based access control framework that can

Cluster Based Data Aggregation in Wireless Sensor Networks: A Bayesian Classifier Approach

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Abstract. The network is composed of wireless distributed sensor nodes with data computational capabilities. In each cluster, the cluster member nodes are used to send the sensed data to its respective cluster head to aggregate and classify the data as effectively. In this work, the algorithm for cluster based aggregation of data using the Naive Bayesian Classifier is proposed. The proposed scheme provides better performance rather than existing algorithms with accuracy, efficient energy utilization, and computation overhead.

Keywords: Wireless Sensor Networks, Data Aggregation, Cluster, Cluster Head, Naive Bayesian Classifier.

1 Introduction

A Wireless Sensor Network (WSN) contains the number of distributed sensor nodes with high computation network. The sensors are scattered over the network, each of these nodes has the capability to process or route the data to sink node or base station through cluster head (CH) nodes. A sink node collects the data from its CHs from each cluster of the WSN for enhancing and decision making of data. The WSN has been used for various real time applications such as military applications, habitat monitoring, environmental monitoring, and so on. In WSN cluster member nodes in each cluster periodically send the data to its respective CHs, then CHs transmits the data over the network. The frequency of reporting sensed data usually depends on the particular applications to the sink node.

In WSN, a grouping of sensor nodes into clusters to satisfy the load balancing, scalability, the efficiency of energy, and better network lifetime. There are several problems that impacts the design and performance of the WSNs are as follows [1][2]: 1) Quality of Service based communication and computing, 2) fault tolerance management issues, 3) routing issues, 4) context aware issues in

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CONTENT

RECENT ADVANCES IN MATERIALS & MANUFACTURING

Numerical method based parametric investigation of isotropic annular plate

Anand C Mattikalli[a] and Rajashekar V Kurahatti[b]

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[b]Basaveshwar Engineering College, Bagalkot-587102,India
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Abstract : Annular plates play a vital role as a part of machine elements for different applications, hence characterization and investigation of annular plate for different parameters is of crucial importance. The current work deals with investigation of isotropic annular plate to study the behavior of annular for variation in boundary conditions, effect of cutout size, number of cutouts and type of cutouts in the annular plate on its static and dynamic behavior. The numerical method is successfully utilized for determination of effect of various parameters on stresses induced, deflection, natural frequency and mode shape.

Keywords: Annular plate; Finite element method; Free vibration; Deformation; Static analysis; Numerical method.

1. INTRODUCTION

Annular plates find several applications in practical world, circular cutting blades, tiles cutter, flywheels, clutch plates, compact discs may be well-thought-out as annular plate for the purpose of analysis [11]. Stress analysis is aimed at determining the deflection and stresses developed in reaction to various applied loads [9]. Modal analysis is carried out to determine to determine the effect of variation in different parameters of the annular plate on fundamental frequency & different modes of vibration.

A good amount of work is carried out on study of the annular plate. Annular disc cutters were analyzed for vibration characteristics [1,10].Finite element method based analysis of polar orthotropic annular plate with an electro rheological (ER) fluid core and constraining layer was investigated to find that ER fluid core was found to have a significant effect on the vibrational behaviors of the sandwich annular plate[2]. Experimental analysis of circular disc with diametral slots was carried and results obtained were compared with numerical method results [3]. Free vibrational behavior of ST37 steel annular plates is investigated for determining the natural frequency by experimental method [4]. Circular plates with multiple circular holes were analyzed for free vibration using indirect BIEMs [5]. In the present work attempt is made to carryout characterization of annular plate by investigating the effect of different boundary conditions, cutout size, number of cutouts and type of cutouts in the annular plate, on its static and dynamic behavior.

2. THEORETICAL FORMULATION

Deflection and stresses

The maximum deflection and stresses developed in the annular plate of outer radius 'a' with inner edge completely constrained made of isotropic material is given by [6].

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The Effects of GGBFS on Strength Properties of Geopolymer Concrete Cured at Ambient Temperature

Aslam Hutagi and R. B. Khadiranaikar

Abstract Geopolymer concrete is an eco-friendly alternative to conventional Portland cement concrete for civil infrastructure applications. Lot of works is available by many researchers to understand the hardened properties of geopolymer concrete by heat curing method. However, in situ condition does not favour the heat curing. Thus, the present investigation is carried out to achieve desirable properties of geopolymer concrete at ambient curing. In the present work, the geopolymer concrete containing 60–100% fly ash (FA) and 0–40% GGBFS is investigated. The study also includes the role of GGBFS on the microstructure. The testing results obtained after 3, 7 and 28 days of ambient curing indicate that there is an increase in the compressive strength, splitting tensile strength and flexural strength significantly. The addition of GGBFS to geopolymer concrete enhances the setting time, rapid strength development is noticed and carbon footprint is significantly reduced.

Keywords Geopolymer concrete · Microstructure · Fly ash · GGBFS Compressive strength

33rd Indian Engineering Congress, The Institution of Engineers (India) Udaipur, 2018
Theme : Integration of Technologies: Emerging Engineering Paradigm

Some Major Properties of High Strength Self-Compacting Concrete

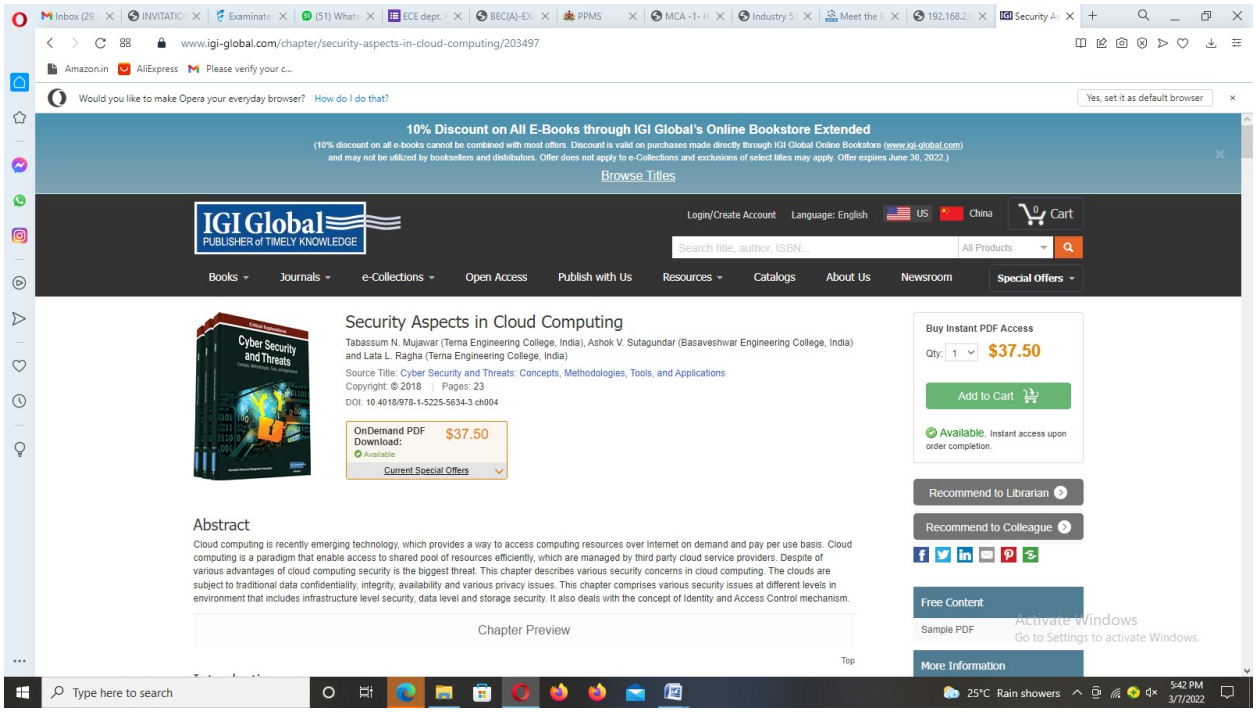
Aijaz Zende[1], Dr R B Khadiranaikar[2]

Abstract: An attempt is made to understand the behaviour of High Strength Self-Compacting Concrete in its fresh and hardened state incorporating mineral admixtures with different percentages of silica fume and fly ash. Experiments were carried out using 12 mixes with different w/c ratios. Four replacements of OPC with fly ash and silica fume of 5%, 10%, 15% and 20% were cast cured for 28 days. The experimental program is carried out in three stages. First, for each mix, fresh properties (slump flow, T-500, V-funnel test and L-box test) are checked. In the second stage, cubes and cylinders were cast and kept in fresh water for curing. Then in the third stage, these samples were used for testing mechanical properties (compressive strength, split tensile strength and modulus of elasticity). The results obtained indicate a direct impact of percentage content of fly-ash and silica fume on the properties of fresh and hardened SCC.

Keywords: Self-Compacting Concrete· Fly ash· Silica fume· Slump flow· T-500· V-funnel test· L-box test

special construction methods and improvement in concrete properties. Given the dense reinforcement around which concrete is required to move, or the complicated geometry of the formwork, and the distances over which concrete needs to be pumped, makes a high demand on the workability of the concrete, and practically "flowing" concrete is required. Needless to say, in order that the concrete does not segregate, this workability and flowability strains the ability of the fluid phase to carry with it the denser aggregate fraction to the limit.

Self-Compacting Concrete (SCC) provides a solution by overcoming this problem as it can flow, compact by itself without any need of vibration or another mean of compaction and fills completely on to the formwork with no segregation [1-4]. SCC can reduce the considerable number of the skilled work force and need of good quality control; thereby it reduces the time of construction. It was also reported that Self-Compacting concrete is more economical than conventional concrete [5]. However, because of its requirement of "highly flowing nature", proper care should be taken so as to achieve filling and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Abstract
Cloud computing is recently emerging technology, which provides a way to access computing resources over Internet on demand and pay per use basis. Cloud computing is a paradigm that enable access to shared pool of resources efficiently, which are managed by third party cloud service providers. Despite of various advantages of cloud computing security is the biggest threat. This chapter describes various security concerns in cloud computing. The clouds are subject to traditional data confidentiality, integrity, availability and various privacy issues. This chapter comprises various security issues at different levels in environment that includes infrastructure level security, data level and storage security. It also deals with the concept of Identity and Access Control mechanism.
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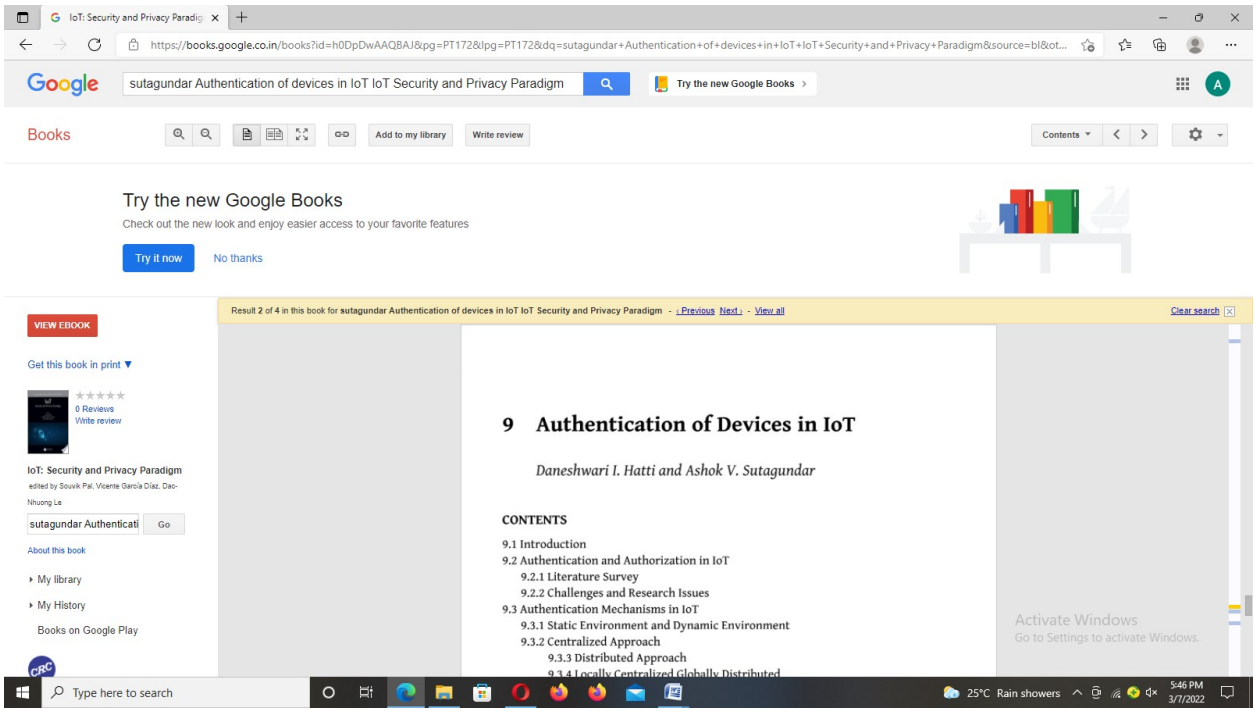
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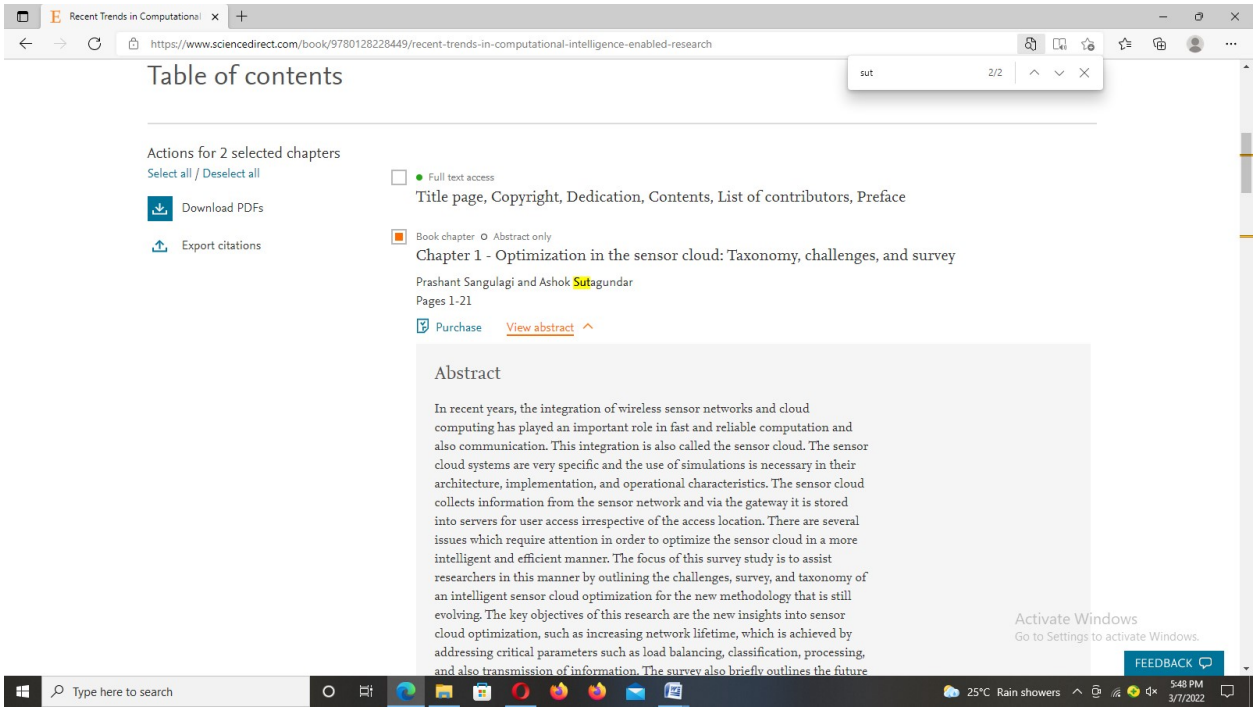
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Chapter 1 - Optimization in the sensor cloud: Taxonomy, challenges, and survey
Prashant Sangulagi and Ashok Sutagundar
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Abstract
In recent years, the integration of wireless sensor networks and cloud computing has played an important role in fast and reliable computation and also communication. This integration is also called the sensor cloud. The sensor cloud systems are very specific and the use of simulations is necessary in their architecture, implementation, and operational characteristics. The sensor cloud collects information from the sensor network and via the gateway it is stored into servers for user access irrespective of the access location. There are several issues which require attention in order to optimize the sensor cloud in a more intelligent and efficient manner. The focus of this survey study is to assist researchers in this manner by outlining the challenges, survey, and taxonomy of an intelligent sensor cloud optimization for the new methodology that is still evolving. The key objectives of this research are the new insights into sensor cloud optimization, such as increasing network lifetime, which is achieved by addressing critical parameters such as load balancing, classification, processing, and also transmission of information. The survey also briefly outlines the future
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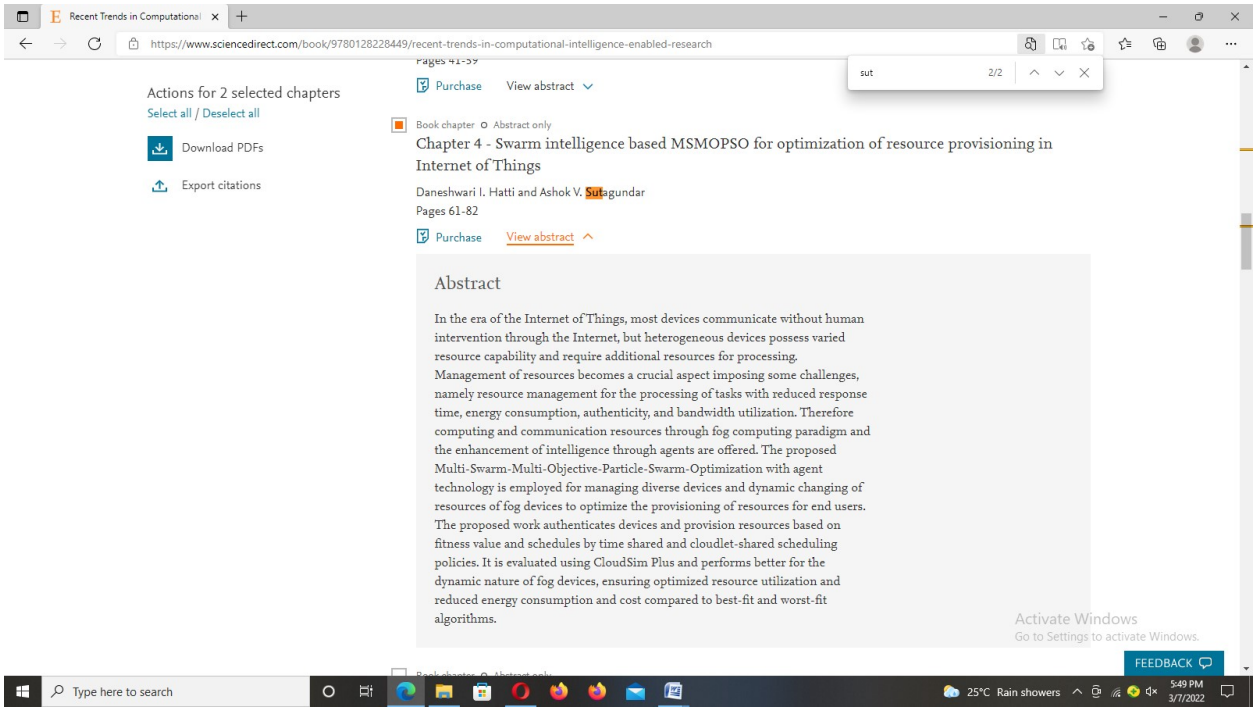
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Chapter 4 - Swarm intelligence based MSMOPSO for optimization of resource provisioning in Internet of Things
Daneshwari I. Hatti and Ashok V. Sutagundar
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Abstract
In the era of the Internet of Things, most devices communicate without human intervention through the Internet, but heterogeneous devices possess varied resource capability and require additional resources for processing. Management of resources becomes a crucial aspect imposing some challenges, namely resource management for the processing of tasks with reduced response time, energy consumption, authenticity, and bandwidth utilization. Therefore computing and communication resources through fog computing paradigm and the enhancement of intelligence through agents are offered. The proposed Multi-Swarm-Multi-Objective-Particle-Swarm-Optimization with agent technology is employed for managing diverse devices and dynamic changing of resources of fog devices to optimize the provisioning of resources for end users. The proposed work authenticates devices and provision resources based on fitness value and schedules by time shared and cloudlet-shared scheduling policies. It is evaluated using CloudSim Plus and performs better for the dynamic nature of fog devices, ensuring optimized resource utilization and reduced energy consumption and cost compared to best-fit and worst-fit algorithms.
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Neural embedded smart link generation scheme for heterogeneous network

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Abstract

The Long Term Evolution (LTE) network is a very much popular network in heterogeneous network. Heterogeneous networks provide maximum data rate by integrating various technologies and channels, based on appropriate network selection. For the sensible data transmission in the LTE network, noise plays an vital role as channel is a free space. The minimum noise channel selection is a decision of present and previous status of network channel. Proposed scheme develop neural network model, which will act as a smart link generation scheme for computing minimum noise channel path for sensible data transmission. Hence, proposed scheme will improve performance of the network. Result indicates that, proposed scheme improves throughput and system reliability. Proposed scheme is also reduces packet loss rate and energy consumption in contrast with conventional techniques.

Keywords: Computer science

1. Introduction

LTE network or future generation network are typically based on integration of GSM and UMTS system, which will form the heterogeneous system. Basic LTE architecture is shown in Fig. 1.

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Intelligent Information Gathering Scheme in Internet of Things (IoT)

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***Abstract*—In recent years, Internet of Things (IoT) has grabbed the attention of the entire world. IoT is a network of physical objects, connected to the Internet, which can be discovered and queried globally. IoT can also be defined as an advanced Wireless Sensor Network (WSN), where the networked sensors are sensing data and transmitting continuously. So, it becomes an obvious challenge to deal with the enormous amount of data that is being gathered. In this paper, we have proposed an intelligent scheme for information gathering in IoT through agent based approach. The main contribution of our proposed research work is to design and develop an intelligent solution for information gathering in IoT.**

***Index Terms*—Internet of Things (IoT), Information Gathering.**

I. Introduction

The IoT concept is being revolutionized because of its huge distributed information, where any real-world physical thing can take part in the Internet automatically, so that the 'thing'can be identified and queried over worldwide. The IoT surrounds with different types of technologies. It also has research scope that focuses on extending the current Internet to real-world physical things. It has got open challenges to address, that includes information gathering, information validation, information aggregation, privacy, data analytics, heterogeneous architecture, energy efficiency, security, Quality of Service, etc. In recent years, IoT has really enhanced the living standard of people and transformed their life style which is an indication of promoting the advancement of science and technology that develops the society [1].

A very basic IoT architecture usually contains three layers: sensing, network, and user application. The sensing layer consists of sensor nodes, and identifies each of the things in the network. It contains RFID tags, sensors, cameras, GPS, etc. The perception layer is the physical layer responsible to identify each object/thing in IoT. This is done with the help of sensors and gathering information about each object. The network layer is the major layer of IoT and has the responsibility of connecting to other smart objects, network devices, and servers and gateways. And responsible for transmission of the information gathered by the perception layer. The application layer converges IoT application services, such as smart cities, smart health, smart homes, etc., to the end user [2].

Compared to other networks, IoT is a complex network as all physical objects participate in the network. Obviously the amount of data collection is also enormous. So it is necessary to adapt some intelligent data gathering techniques. An object may send the information it has observed or sensed, directly to its neighboring sensor nodes. It may happen that some nodes do not need the same information to mislead the users. During these situations certain information validation methods should be adapted before forwarding it to the other sensor nodes. Information aggregation approach usually combines several messages pertaining to same event to form a single consolidated message, thereby reducing the number of packet transmissions. These techniques are useful to reduce overheads. Data aggregation mechanism also improves the lifetime of nodes by eliminating redundant data transmission.

The fundamental technologies and architectures of IoT are proposed in [3] - [5]. The architecture describes the encapsulation of sensor technology, RFID, logic for embedding the objects, ad-hoc network conditions, information infrastructure for Internet for the use of smart object framework. The objective is to make the reader understand the current stage of the IoT, methodologies that assists, the applications, challenge and the developments through a complete analysis and categorizing the literature [6].

The rest of the paper is organized as follows. Related work is discussed in Section II, the proposed data gathering scheme is illustrated in Section III, simulation and result analysis are discussed in sections IV and V respectively, and conclusions are drawn in Section VI.

II. Related Works

The necessary technical issues of IoT like exchange of information within massive different and unrelated network components, proper combination and interaction adjustment of varying data and service adjustment in the dynamic environment are addressed in [7] [8]. The perspective, issues, possible usage situations and IoT technological building blocks are discussed in [9]. Particularly, the RFID and scientific improvements like Internet protocol stacks and web servers are concentrated for smart everyday objects. Societal and ethical issues which will commonly arise are presented in [10].

Different challenges and orientation for advancement in mobile cloud computing for IoT, like safety issues along with its feasible clarification,managing the storage issues, continuous connection of network are discussed in [11]. The work mentioned in [12] describes a routing protocol which organizes by itself that is based on the geography. It presents an approximate algorithm that estimates how many number of nodes are supervising the area with approximate shape and size. To build the Infrastructure for prototyping the system that focuses to design basis model for IoT information is proposed in [13]. It illustrates important building blocks in the framework and their jobs and provides information regarding

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Cascaded Structure of Noise Reduction and Multiband Frequency Compression of speech signal to Improve Speech Perception for monaural Hearing Aids

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Abstract - **This paper presents a cascaded structure of noise reduction and multiband frequency compression in enhancing speech perception for sensorineural hearing impaired persons using monaural hearing aid. In multiband frequency compression scheme, input signal is divided into 18 frequency bands ranging from 0 to 5 KHz based on auditory critical bandwidths (ACB). Frequency components of each band are compressed at the center of their respective bands using frequency segment mapping method. This results in concentration of all spectral energy at the center of each band to minimize the effect of spectral masking. Noise reduction scheme, namely wiener filter is used to reduce the background noise. Evaluation process involves i) Speech quality assessment (using PESQ and MOS) on normal –hearing subjects ii) Speech intelligibility assessment (using MRT) on hearing-impaired subjects. The test material consists 50 sets of consonant-vowel-consonant (CVC) words. Each set includes six words. Each subject is responded for 1800 presentations (300 CVC words x 6 different SNR conditions). The MOS, PESQ and MRT scores obtained for the SNR values ranging from -6 dB to + 6 dB indicates enhancement in speech quality and intelligibility.**

Keywords- Sensorineural Hearing Loss (SNHL); Spectral Masking; Multiband Frequency Compression; MOS; PESQ

I. INTRODUCTION

Hearing loss mainly happens when the working of cochlea and the auditory nerve does not function properly. Usually auditory filter bandwidth gets widened and results in reduced frequency selectivity because of the masking of frequency components [1] [2] [3]. This results in listening discomfort by hearing impaired people. Furthermore, intelligibility of the speech gets reduced in the presence of background noise. Hence under noisy environments hearing impaired people find difficulty in understanding speech signal. Therefore Noise reduction techniques as well as hearing aid algorithms are essential to improve quality and the intelligibility of speech under adverse listening conditions.

Many single and multi channel noise reduction techniques have been proposed in past which are applicable for both monaural and binaural hearing aids. Noise reduction techniques helps in achieving similar speech intelligibility as that of normal hearing people in noisy environments. Some of the single channel noise reduction techniques are Spectral subtraction [4], spectral subtraction using spectral floor and over-subtraction [5], wiener filter [6] etc. Multichannel noise reduction techniques exploit spectral and temporal differences and also the spatial separation between sound sources to improve SNR [7]. Spatial domain (direction or location) difference between a target and noise signal can be used to achieve noise reduction in different noisy conditions using a system with a microphone array [8].

Hearing aids help in amplification (frequency-dependent) of speech signals for hearing-aid users. Existing hearing aids do not provide sufficient amplification of high frequency speech sounds [9]. This restricts the audibility of high frequency sounds, predominantly for severely hearing impaired subjects. High frequency samples of speech signal are shifted to low frequency regions by using frequency transposition methods [10]. Transposition of frequency sample methods proposed in [11]-[14] were useful in speech recognition, but distorts the speech quality. Multi-band frequency compression method to reduce frequency masking associated with SNHL persons is discussed [15]. By using frequency compression, frequency lowering or frequency transposition algorithms the effect of frequency masking can be minimized to some extent in noisy environments, but results in degraded speech quality. In order to improve speech perception in noisy conditions, and to overcome spectral masking associated with sensorineural hearing loss (SNHL) listeners, a cascaded structure of noise reduction (using wiener filter) and multiband frequency compression of the speech signal is proposed.

Remaining part of the paper is as follows. Section II explains signal processing. Tests and result analysis are given in section III. Spectrograms are explained in section IV. Section V concludes our research work.

II. SIGNAL PROCESSING

This study presents a cascaded structure of (i) Noise reduction and (ii) Multi band frequency compression of the speech signal for SNHL listeners. Wiener filter is used in our cascaded scheme to reduce the noise present in a speech signal. Wiener filter [16] minimizes the mean square error (MSE) between the desired signal and an estimated signal. Wiener filter requires separate estimate of the clean speech and the noise power which can be estimated using a Voice Activity Detector (VAD). Proposed VAD method to discriminate between speech and noise is shown in Figure 2.

In multi band compression scheme, the speech signal sampled at 10 KHz sampling frequency is segregated into number of frames (frame duration of 20ms and frame overlap of 50%). Hamming widow is applied for each of these frames. The frequency scale is then partitioned into 18 bands based on Auditory Critical Bandwidths (ACB) [17].

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EFFECT OF NOISE REDUCTION ALGORITHMS ON TEMPORAL SPLITTING OF SPEECH SIGNAL TO IMPROVE SPEECH PERCEPTION FOR BINAURAL HEARING AIDS

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Sensorineural hearing loss which occurs due to the damage of cochlea, auditory nerves or both, is characterized by elevated hearing thresholds, loudness recruitment, reduced temporal and frequency resolution, and increased temporal and spectral masking. Increased temporal masking affects the speech perception in persons with sensorineural hearing impairment especially under adverse listening conditions. Hearing aid users have problem in speech understanding particularly in the presence of background noise. Hence, hearing aids should include noise reduction techniques for enhancing the speech perception. This paper presents a cascaded scheme, which employs a noise reduction algorithm as well as temporal splitting of the speech signal. The main objective of the paper is to improve quality of perceived speech for SNHL listeners by reducing the temporal masking and improve the speech perception in the background of additive noise. Earlier investigations have shown that by splitting the speech temporally and presenting alternate segments to the two ears help in reducing the effect of temporal masking. In this technique, the speech signal is processed by two fading functions, complementary to each other, and presented to left and right ears for binaural dichotic presentation. In the present study, half cosine signal is used as fading function with crossover gain of 6 dB for perceptual balance of loudness. Temporal splitting is combined with noise reduction algorithm to improve speech perception in the background noise. Two noise reduction schemes, namely spectral subtraction and Wiener filter are used. We have used Voice Activity Detection (VAD) based on short term energy and zero crossing rates to detect noise and speech frames separately. Listening tests were conducted on six normal hearing subjects, with sensorineural loss simulated by adding broadband noise to the speech signal at different signal-to-noise ratios (∞, 3, 0, and -3 dB) using mean opinion score(MOS) test. Objective evaluation using PESQ was also carried out. The MOS score for VCV syllable /asha/ for SNR values of ∞, 3, 0, and -3 dB were 5, 4.46, 4.4 and 4.05 respectively, while the corresponding MOS scores for unprocessed speech were 5, 1.2, 0.9 and 0.65, indicating significant improvement in the perceived speech quality for the proposed scheme compared to the unprocessed speech.

1. Introduction

Sensorineural hearing loss which occurs due to the damage of cochlea, auditory nerves or both, is characterized by elevated hearing threshold, loudness recruitment, reduced temporal and frequency resolution, and increased temporal and spectral masking [1] [2]. Temporal masking, also known as

OPTIMIZATION OF LEACH PROTOCOL FOR EFFECTIVE POWER UTILIZATION IN WIRELESS SENSOR NETWORKS

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Abstract: Energy utilization of the sensor nodes is a major challenge that is being encountered in low-powered Wireless Sensor Networks (WSNs) when designing an algorithm, protocol or hardware. Based on the existing LEACH protocol, a new clustering protocol for wireless sensor networks is proposed and implemented in this paper. The outcome of this work is reduction in the energy consumption for sending the sensed data from sensor deployment place to the base station. In the existing LEACH protocol, cluster heads collect the data from sensors in the cluster and aggregate it. Then aggregated data is directly sent to the base station. But in our scheme, we differentiate the cluster heads which are far and near to the base station. Depending upon the distance the far node from the base station will send its aggregated data to the next neighbouring cluster head. Above cycle will be repeated until the entire data is delivered to the base station by its nearest cluster head.

Keywords: LEACH, Effective Power Utilization, Cluster Head, TDMA.

INTRODUCTION

Sensor networks refers [1] to a heterogeneous system consisting of multiple detection stations called sensor nodes with a communications infrastructure intended to monitor and record conditions at diverse locations. Sensor nodes, also known as mote, are small, light weight and portable devices equipped with a transducer, microcomputer, transceiver, and power source. The transducer produces electrical signals based on the sensed physical phenomena. The microcomputer processes and stores the sensed information. The transceiver receives instructions from the base station/central computing system and sends data to it. Each sensor nodes derives its energy usually from a battery or any other embedded form of energy harvesting. The size of the sensor nodes vary from that of a shoebox to that of a minute sand-particle. Similarly their cost also varies from hundreds of dollars to a few pennies. Size and cost constraints result in corresponding constraints on energy, memory, computational speed and communications bandwidth.

Wireless Sensor Networks [2] are characterized by:

- Limited power they can harvest or store.
- Ability to cope with node failures.
- Heterogeneity of nodes.
- Large scale of deployment.
- Mobility of nodes.
- Communication failures.
- Dynamic network topology.
- Ability to withstand harsh environmental conditions.

Various protocols exist for addressing the issue of utilizing the available limited power they can harvest or store such as TREEPSI (Tree based Energy Efficient Protocol for Sensor Information), TBC (Tree based Clustering for Energy Efficient Wireless Sensor Networks), EDACH (Energy Driven Adaptive Clustering Hierarchy), TEEN (Threshold Sensitive Energy Efficient Sensor Networks), LEACH (Low Energy Adaptive Clustering Hierarchy), etc. LEACH is an effective energy efficient hierarchical-based routing protocol. Our prime focus is on the analysis of LEACH based upon certain parameters like network lifetime, stability period, etc. and also the effect of selective forwarding attack and degree of heterogeneity on LEACH protocol. Energy is not properly utilized and throughput is decreased in networks compromised by selective forwarding attack but the number of cluster-heads per round remains unaffected in such networks.

The wireless sensor node, being a micro-electronic device, can only be equipped with a limited power source ($\leq$ 0.5 Ah, 1.2 V). In some application scenarios, replenishment of power resources might be impossible. Sensor node lifetime, therefore, shows a strong dependence on battery lifetime. Power consumption can hence be divided into three domains:

1. Sensing Power
2. Communication Power
3. Data Processing Power

LEACH reduces the amount of energy consumed during data transmission and as a consequence, the energy that the radio consumed. Thus the energy utilization is reduced. In our scheme, we are further reducing the amount of energy spent by each node to transmit its data by more than 40$\%$ approximately as compared to the existing LEACH protocol.

Data gathering is the main objective of sensor nodes. The sensors periodically sense the data from the surrounding environment, process it and transmit it to the base station or sink node. The frequency of reporting the data and the number of sensors which report the data depends on the particular application. Data gathering

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Health Management of a Typical Small Aircraft Fuel System using an Adaptive Technique

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***Abstract*— Faults in the aircraft fuel system will degrade its performance and may lead to the complete system failure. In commercial aircraft system, efficient diagnosis can optimize the time to return the aircraft to service, thus allowing less disruption to passenger travel. In this work, an adaptive fault diagnosis technique is developed for a typical small aircraft fuel system, which facilitates efficient learning procedure to forecast the system parameters for non-linear situations. This adaptive technique represents the integration of the Fuzzy Logic and Support Vector Machine (SVM) algorithms in the field of fault diagnosis. Using this adaptive technique health monitoring of aircraft fuel system is discussed. In an aircraft fuel tank, the fault is effectively located by assessing and contrasting the actual parameters and set point parameters related to the system for various time-frames. The fuzzy logic controller is configured with the logical rules as per the required target output. It relies on the aircraft fuel system parameters like the fuel flow rate, level of fuel in the tank, fuel temperature, and fuel pressure. From the logical rules, the control signals related to the aircraft fuel system are derived by the SVM technique. The efficiency in execution of this fault diagnosis tool-based aircraft fuel system gets authenticated in the MATLab/Simulink platform. The simulation is carried by assuming normal operating conditions of aircraft in the laboratory environment.**

Keywords-aircraft fuel system, system health management, fault diagnosis, fault prognosis, SVM, fuzzy logic

I. INTRODUCTION

Nowadays, aviation is becoming an integral part of our daily lives and airplane is becoming an essential method of passenger and cargo transports. Integrated Vehicle Health Management (IVHM) of airplanes strongly influences the maintenance efficiency of civil and military fleets. Guigang Zhang *et al.* [1] suggested a framework of system health management that provides integrated health management of airplanes running worldwide. This monitors the health status of flight in order to build a suitable mechanism for managing the real-time fault diagnosis, fault prediction and intelligent maintenance decision of airplanes. Model-based simulation approach as implemented is a robust framework for the design and analysis of complex systems in recent years [2,3]. This approach is also used to manage failures and complexities during the design and simulation phases of the system. The selection of a particular design of a system for fault diagnosis and prognosis has to be made through a trade-off between safety, cost, and performance of the system [4].

The positive impact on the development of system health management is on the maintenance cost and the extra cost due to the unscheduled maintenance of the aircraft. The purpose of the System Health Management (SHM) process is to utilize the best possible fault identification, detection and prediction of remaining useful life of the system, sub-system or a component. In this work, a simulation model is built for the fuel system of a typical small aircraft that helps to correct and mitigate the current fault status. An adaptive health management methodology is developed by integrating fuzzy logic and SVM techniques which facilitates to diagnose the faults and take corrective measures to meet the required rate of fuel to the engines.

II. RELATED WORK

This section provides a brief literature review on system health management techniques. R. Guo *et al.* [5] presents a fault diagnosis expert system for different faults in a civil aircraft which is based on the fault tree analysis. The designing method of each module is given in detail, and the process of calculation is simplified through Direct Binary Decision Diagrams (DBDD) method, which investigates component probability importance. They presented an analysis of landing gear retraction system and explained the feasibility of the design of an expert system-based fault diagnosis method for civil aircraft. Regenerative braking is one of the vital technologies utilized in hybrid electric automobiles to improve the stability of the vehicle and also to analyze its energy efficiency. Chaitanya Sankavaram *et al.* [6] have presented an efficient data-driven technique for detecting and diagnosing faults in the regenerative braking system of hybrid electric vehicles where it includes signal processing and statistical techniques for feature extraction and fault classification methodologies to identify, detect and isolate faults in the regenerative braking system. The results demonstrate that highly accurate fault diagnosis is possible with the classification methodologies. The process can be employed for fault analysis in a wide variety of systems from automobiles to aerospace sectors.

The synergistic integration of information from electronic sensors and human sources is called hard/soft

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Performance Analysis of Ant Colony based Routing Approach for VANETs using VanetMobiSim and NS2

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***Abstract*— Vehicular networks are a class of wireless networks built dynamically in an ad hoc network manner. Routing mechanism is an important component for the success of any vehicular applications. The routing mechanism in vehicular networks is critical because of VANET constraints such as unpredictable network topology, frequent disconnections, varying network densities, etc. Bio-inspired algorithms are the part of the natural computations. These algorithms are basically inspired by the insects like bee, ants, fish etc. by nature. Ant Colony Optimization (ACO) technique has proved as a good technique for developing routing algorithms in ad hoc networks. In this paper, we have applied the ACO technique for routing in car to car and car to road side communication infrastructure under VANET constraints. Performance parameters analyzed are packet delivery ratio, throughput, End-to-End delay, and Control Overheads. The comparison analysis is done using network simulators NS-2 and VanetMobiSim to generate realistic vehicular traffic of a particular area i.e., Bagalkot city, Karnataka state of India.**

Keywords*— *V2V, V2I, VANETs, Ant Colony Optimization

I. INTRODUCTION

Modern vehicles with capability of sophisticated computing and communication are a good sign for Vehicular Adhoc Networks (VANETs). VANETs communicate with IEEE 802.11p (dedicated short range communication/Wireless access for vehicular environment).Information aggregation, validation and dissemination in VANETs are usually built with routing protocols. In VANETs, efficient routing protocols should address the issues such as unpredictable topology, density of vehicles, mobility, heterogeneous communication environment, etc. [1] – [3].

Many research works have been proposed for bio inspired routing in VANET for improvement of routing mechanism. Few on-going related research works are summarized as follows. The work given in [4] mentioned the various information management schemes considering four network architectures of VANET as Vehicle-to-Vehicle (V2V), Vehicle-to-Infrastructure (V2I), Vehicle-to-Pedestrian (V2P) and hybrid network architecture. Ad-hoc On demand Distance Vector(AODV) routing mechanism is analysed and compared with Dynamic Source Routing(DSR), Temporally Ordered Routing Algorithm (TORA), Associativity Based Routing (ABR) in [5]. Comparison of different routing protocols like AODV, DSR, Destination Sequence Distance vector Routing (DSDV), and TORA for different parameters is mentioned in [6]. Bio-inspired routing protocol characters, advantages and disadvantages are discussed in [7]. For better performance of routing protocol, it is better to optimize the results using bio-inspired algorithms like Ant Colony based Optimization (ACO) techniques and Particle Swarm Optimization(PSO) technique. This helps to find multiple paths and avoids link failure. Performance analysis of routing protocol and its optimization is also evaluated on the basis of QoS parameters such as energy consumption, jitter, throughput, delay, routing load, packet loss, and packet delivery ratio. The performance parameters using Zone Routing Protocol (ZRP), DSR, DSDV and Distance Routing Effect algorithm for Mobility (DREAM)& Simple Forwarding over Trajectory (SIFT) are analysed in [8].

Secured routing protocol based on the calculation of the trust worthiness of the path is explained in [9]. ACO is used as an intelligent technique to calculate the trust paths. Improvement of QoS in terms of route selection over the network is discussed in [10]. ACO approach is used for the Vehicle Routing Problem. Dynamic MANET On demand (DYMO) protocol avoids the issue of network congestion if an accident happens in VANET.

Opposition based Ant Colony Optimization (OACO) algorithm for highways is proposed in [11]. The research works mentioned in [12] – [13] discuss ACO algorithm with the available vehicle position and mobility that performs well in the dynamics of such vehicular networks. DYMO routing protocol is adopted for ACO algorithm leading to Mobility Aware ant colony optimization Routing DYMO (MAR-DYMO). MAR-DYMO performance is evaluated for city scenario and analysed with standard routing schemes.

Ant colony algorithm also prevents attacks and helps in establishing secure and efficient route from source to destination is proposed in [14]. Ontology and vehicle traffic information based routing mechanism ensures the packets transmission with reliable connectivity is discussed in [15]. This paper is organised as follows. In section II, a brief explanation of ACO for VANETs is presented. Section III presents simulation model, simulation inputs and result analysis. Finally, section IV concludes the proposed scheme.

II. ANT COLONY OPTIMIZATION FOR VANET

Ant Colony Optimization (ACO) technique based on travelling salesman problem is proposed for VANET environment (i.e., V2V & V2I).

A. Ant Colony Optimization (ACO)Technique

Bio-inspired algorithms are the part of the natural computations. They use bottom up approach and decentralized approach. These algorithms are basically inspired by the insects like bee, ants, fish etc. by nature. These algorithms are basically having some set of rules and

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A Survey on Information Disssemination in VANETs

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***Abstract*—Vehicular Ad hoc Network (VANET) has become an active area of research, standardization, and development because next generation vehicles will have capability of sensing, computing, and communicating capabilities. Different components in a vehicle have to constantly exchange available information with other vehicles on the road and cooperate for the purpose of ensuring safety and comfort of users using VANET. In this chapter, we survey some of the ongoing recent research efforts in information dissemination in VANETs. We also outline some of the research challenges that still need to be addressed to enable efficient information dissemination in VANET.**

I. Introduction

A Mobile Ad-hoc Network (MANET) is comprised of a group of mobile nodes which have the capability of self-organization in a decentralized fashion and without fixed infrastructure. A Vehicular Ad hoc Network (VANET) is an example of a MANET where the mobile nodes are the vehicles themselves. Communication is possible between vehicles within each other's radio range as well as with fixed road side infrastructure components. The VANET concept is an integral part of the intelligent transportation system (ITS) architecture, which aims to improve road safety, optimize traffic flow, reduce congestion, and so on [1]-[6].

The key differences of VANET as compared to MANET environment are as follows: 1) components building the network are vehicles, 2) restricted mobility constraints, 3) extremely high mobility and time-varying vehicle traffic density, 4) most of the vehicles provide sufficient computational and power resources, thus eliminating the need for introducing complicated energy-aware algorithms, 5) vehicles will not be affected by the addition of extra weight for antennas and additional hardware.

VANET raises several interesting issues with regard to Media access control (MAC), Mobility management, Data aggregation, Data validation, Data dissemination, Routing, Network Congestion, Performance analysis, Privacy and Security.

With the increase of portable devices as well as progress in wireless communication, vehicular ad hoc networking is gaining importance with the increasing number of widespread applications. Some of the important applications of VANETs are as follows: 1) message and file delivery, 2) providing location-dependent services like the location of the nearest facilities like fuel stations, parking zones, entertainment places and restaurants, etc., 3) Internet connectivity, 4) information and warning functions, 5) dissemination of road information (including incidents, congestion, surface condition, etc.) to vehicles distant from the subjected site, 6) co-operative assistance systems, 7) traffic monitoring and management services, 8) other advanced services like interactions between VANET nodes and the road infrastructure, for example traffic calming measures (including automatic speed limiters), intelligent road signs, tolling (congestion charges for entering urban areas at peak times, cargo monitoring, etc.,).

VANET architectures for vehicular communication may be classified into three types: purely ad hoc based, infrastructure based and hybrid type. In the purely ad hoc based VANET architecture, vehicle to vehicle (V2V) communication exists. In the infrastructure based VANET, communication is possible in between vehicles using infrastructure (V2I) such as base stations or access points on the road. Combination of V2V and V2I architectures leads to the hybrid mode of VANET.

VANET scenario (hybrid) is as shown in the figure 1. All vehicles are equipped with General Positioning Systems (GPS) and on-board communication devices for communication. Each vehicle is loaded with location digital map and is concerned about road information ahead of it on its direction. Each vehicle communicates with other vehicle and road side unit (like base station, gateway, etc.) within its communication range R. Vehicles within the communication range R form clusters (C1, C2,..CN). All the road side unit are connected to regional transportation system.

II. Related works

Researchers have started to address information dissemination related issues in VANET. Some of the research works for information dissemination in VANETs are as follows. A method for cars to autonomously and cooperatively collect traffic jam statistics to estimate arrival time to destination for each car using inter-vehicle communication is proposed in [7]. Optimal next-hop selection in a route between two

Cascaded Structure of Noise Reduction and Multiband Frequency Compression of speech signal to Improve Speech Perception for monaural Hearing Aids

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***Abstract* - This paper presents a cascaded structure of noise reduction and multiband frequency compression in enhancing speech perception for sensorineural hearing impaired persons using monaural hearing aid. In multiband frequency compression scheme, input signal is divided into 18 frequency bands ranging from 0 to 5 KHz based on auditory critical bandwidths (ACB). Frequency components of each band are compressed at the center of their respective bands using frequency segment mapping method. This results in concentration of all spectral energy at the center of each band to minimize the effect of spectral masking. Noise reduction scheme, namely wiener filter is used to reduce the background noise. Evaluation process involves i) Speech quality assessment (using PESQ and MOS) on normal –hearing subjects ii) Speech intelligibility assessment (using MRT) on hearing-impaired subjects. The test material consists 50 sets of consonant-vowel-consonant (CVC) words. Each set includes six words. Each subject is responded for 1800 presentations (300 CVC words x 6 different SNR conditions). The MOS, PESQ and MRT scores obtained for the SNR values ranging from -6 dB to + 6 dB indicates enhancement in speech quality and intelligibility.**

Keywords- Sensorineural Hearing Loss (SNHL); Spectral Masking; Multiband Frequency Compression; MOS; PESQ

I. INTRODUCTION

Hearing loss mainly happens when the working of cochlea and the auditory nerve does not function properly. Usually auditory filter bandwidth gets widened and results in reduced frequency selectivity because of the masking of frequency components [1] [2] [3]. This results in listening discomfort by hearing impaired people. Furthermore, intelligibility of the speech gets reduced in the presence of background noise. Hence under noisy environments hearing impaired people find difficulty in understanding speech signal. Therefore Noise reduction techniques as well as hearing aid algorithms are essential to improve quality and the intelligibility of speech under adverse listening conditions.

Many single and multi channel noise reduction techniques have been proposed in past which are applicable for both monaural and binaural hearing aids. Noise reduction techniques helps in achieving similar speech intelligibility as that of normal hearing people in noisy environments. Some of the single channel noise reduction techniques are Spectral subtraction [4], spectral subtraction using spectral floor and over-subtraction [5], wiener filter [6] etc. Multichannel noise reduction techniques exploit spectral and temporal differences and also the spatial separation between sound sources to improve SNR [7]. Spatial domain (direction or location) difference between a target and noise signal can be used to achieve noise reduction in different noisy conditions using a system with a microphone array [8].

Hearing aids help in amplification (frequency-dependent) of speech signals for hearing-aid users. Existing hearing aids do not provide sufficient amplification of high frequency speech sounds [9]. This restricts the audibility of high frequency sounds, predominantly for severely hearing impaired subjects. High frequency samples of speech signal are shifted to low frequency regions by using frequency transposition methods [10]. Transposition of frequency sample methods proposed in [11]-[14] were useful in speech recognition, but distorts the speech quality. Multi-band frequency compression method to reduce frequency masking associated with SNHL persons is discussed [15]. By using frequency compression, frequency lowering or frequency transposition algorithms the effect of frequency masking can be minimized to some extent in noisy environments, but results in degraded speech quality. In order to improve speech perception in noisy conditions, and to overcome spectral masking associated with sensorineural hearing loss (SNHL) listeners, a cascaded structure of noise reduction (using wiener filter) and multiband frequency compression of the speech signal is proposed.

Remaining part of the paper is as follows. Section II explains signal processing. Tests and result analysis are given in section III. Spectrograms are explained in section IV. Section V concludes our research work.

II. SIGNAL PROCESSING

This study presents a cascaded structure of (i) Noise reduction and (ii) Multi band frequency compression of the speech signal for SNHL listeners. Wiener filter is used in our cascaded scheme to reduce the noise present in a speech signal. Wiener filter [16] minimizes the mean square error (MSE) between the desired signal and an estimated signal. Wiener filter requires separate estimate of the clean speech and the noise power which can be estimated using a Voice Activity Detector (VAD). Proposed VAD method to discriminate between speech and noise is shown in Figure 2.

In multi band compression scheme, the speech signal sampled at 10 KHz sampling frequency is segregated into number of frames (frame duration of 20ms and frame overlap of 50%). Hamming widow is applied for each of these frames. The frequency scale is then partitioned into 18 bands based on Auditory Critical Bandwidths (ACB) [17].

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Cascaded Structure of Wiener Filter with FBS based Spectral Splitting and Dynamic Range Compression For Listeners with Sensorineural Hearing Loss

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Abstract- **This paper presents a cascaded structure of wiener filter followed by spectral splitting using Filter Bank Summation (FBS) method and dynamic range compression with constant compression factor for binaural dichotic presentation. This helps to compensate the effect of spectral masking, reduced dynamic range for moderate sensorineural hearing loss and also improves speech perception in the adverse listening conditions by removing unwanted noise. Wiener filter is used as noise reduction algorithm. Using auditory critical bandwidths, the signal is separated into eighteen frequency bands, varying from 0-5 KHz. Spectral splitting is performed by combing odd and even numbered filter bands and presented to the left and right ears respectively that help in reducing the effect of frequency masking. Amplitude compression using fixed compression factor (0.4, 0.6 and 0.8) in each band was carried out that helps in compensating the reduced dynamic range of the hearing impaired people. Listening tests using Mean Opinion Score (MOS) on normal-hearing subjects were conducted to test the perceived quality of the processed speech. VCV syllable /aba/ and sentences were used as the test material. The results of the listening tests showed that the MOS scores for the processed speech (4.31, 4.06, 3.68, 3.5, 3.067 and 2.612) were higher as compared with those for unprocessed speech (4.48, 1.2, 1.13, 1.06, 0.8 and 0.45) for SNR values of ∞, +6, +3, 0, -3 and -6 dB respectively, indicating the improvement in the perceived quality for different SNR conditions for the compression factor of 0.6. To estimate the intelligibility of the perceived speech, listening test was also carried out on hearing impaired (moderate SNHL) subjects in the presence of background noise using Modified Rhyme Test (MRT).The test material consists 50 sets of monosyllabic words of consonant-vowel-consonant (CVC) form with six words in each set. Each subject is responded for total of 1800 presentations (300 words x 6 different SNR conditions). Results of the listening tests (using MRT) showed maximum improvement in speech recognition scores (23.49 - 27.29%) compared to unprocessed speech, indicating enhancement in intelligibility of the speech at lower SNR values.**

Keywords-Wiener Noise Reduction Algorithm, Filter bank summation (FBS) method, Dynamic Range Compression (DRC), Spectral Splitting, Mean Opinion Score (MOS), Modified Rhyme Test (MRT)

I. INTRODUCTION

Degraded speech perception, increased temporal and spectral masking and reduced dynamic range between threshold of hearing and discomfort level are some of the problems associated with sensorineural hearing impaired people [1]. Furthermore, speech intelligibility gets reduced in the presence of background noise. Therefore hearing impaired people need a higher signal-to-noise-ratio (SNR) to effectively communicate.

Noise reduction in hearing aids is a very challenging issue because the properties of the noise signal change significantly with time. Hence it is very difficult to develop an algorithm that works in different listening environments. The nature and properties of noise sources are very important in deciding which noise reduction algorithm works well to enhance speech signal by eliminating the noise from the corrupted signal. Some of the noise reduction schemes applicable for hearing aids are spectral subtraction, wiener filter, and beam former approaches [2] [3] [4]. Comb filter pairs (with complementary magnitude responses) were used to enhance the intelligibility of perceived speech for bilateral hearing (moderate SNHL) impaired subjects [5].

Dynamic range Compression can be implemented in either within a single frequency band or multiple frequency bands i.e., multiband compression. Hearing aids employing dynamic compression split the signal into number of frequency bands, and amplitude compression is carried out in these bands. Filter bank summation technique (FBST) is used for multiband amplitude compression [6] to partly compensate the effect of reduced dynamic range for the people with sensorineural hearing loss. Therefore it is essential for hearing aids to improve speech perception under adverse listening conditions, and also to overcome the effects of reduced dynamic range and spectral masking effect associated with SNHL listeners.

Hence in our proposed work, we have cascaded wiener filter followed by spectral splitting using Filter Bank Summation (FBS) method and dynamic range compression using constant compression factor. Wiener filter obtains the enhanced signal by optimizing the mean square error criteria. In FBS method, frequencies ranging from 0-5000Hz are partitioned into 18 bands, depending on auditory critical bands. Each band is amplitude compressed with the constant compression factor of 0.4, 0.6 and 0.8. Spectral splitting of compressed speech is carried by combining odd numbered and even numbered filters and presented them to two ears.

Rest of the paper is organized as follows. Related works are discussed in section II. Proposed algorithm is given in section III. Tests and Result analysis are given in section IV. Spectrographic analysis is discussed in section V. Finally, section VI concludes the work.

II. RELATED WORKS

Many studies have investigated the different signal processing techniques to overcome the problem of SNHL

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EFFECT OF NOISE REDUCTION ALGORITHMS ON TEMPORAL SPLITTING OF SPEECH SIGNAL TO IMPROVE SPEECH PERCEPTION FOR BINAURAL HEARING AIDS

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Sensorineural hearing loss which occurs due to the damage of cochlea, auditory nerves or both, is characterized by elevated hearing thresholds, loudness recruitment, reduced temporal and frequency resolution, and increased temporal and spectral masking. Increased temporal masking affects the speech perception in persons with sensorineural hearing impairment especially under adverse listening conditions. Hearing aid users have problem in speech understanding particularly in the presence of background noise. Hence, hearing aids should include noise reduction techniques for enhancing the speech perception. This paper presents a cascaded scheme, which employs a noise reduction algorithm as well as temporal splitting of the speech signal. The main objective of the paper is to improve quality of perceived speech for SNHL listeners by reducing the temporal masking and improve the speech perception in the background of additive noise. Earlier investigations have shown that by splitting the speech temporally and presenting alternate segments to the two ears help in reducing the effect of temporal masking. In this technique, the speech signal is processed by two fading functions, complementary to each other, and presented to left and right ears for binaural dichotic presentation. In the present study, half cosine signal is used as fading function with crossover gain of 6 dB for perceptual balance of loudness. Temporal splitting is combined with noise reduction algorithm to improve speech perception in the background noise. Two noise reduction schemes, namely spectral subtraction and Wiener filter are used. We have used Voice Activity Detection (VAD) based on short term energy and zero crossing rates to detect noise and speech frames separately. Listening tests were conducted on six normal hearing subjects, with sensorineural loss simulated by adding broadband noise to the speech signal at different signal-to-noise ratios (∞, 3, 0, and -3 dB) using mean opinion score(MOS) test. Objective evaluation using PESQ was also carried out. The MOS score for VCV syllable /asha/ for SNR values of ∞, 3, 0, and -3 dB were 5, 4.46, 4.4 and 4.05 respectively, while the corresponding MOS scores for unprocessed speech were 5, 1.2, 0.9 and 0.65, indicating significant improvement in the perceived speech quality for the proposed scheme compared to the unprocessed speech.

1. Introduction

Sensorineural hearing loss which occurs due to the damage of cochlea, auditory nerves or both, is characterized by elevated hearing threshold, loudness recruitment, reduced temporal and frequency resolution, and increased temporal and spectral masking [1] [2]. Temporal masking, also known as

Agent Based Job Classification and Resource Allocation in IoT

Publisher: IEEE

2 Author(s) Daneshwari I. Hatti ; Ashok V. Sutagundar **View All Authors**

Abstract: Internet of Things (IoT) is combination of things and Internet. Things in IoT communicate via Internet. IoT has several heterogeneous devices and results to many issues. ... **View more**

Metadata

Abstract:
Internet of Things (IoT) is combination of things and Internet. Things in IoT communicate via Internet. IoT has several heterogeneous devices and results to many issues. In this work we have proposed agent based job classification and resource allocation in IoT. In the proposed methodology agent uses the Fuzzy Interference System. Agents are defined in two hierarchy namely at Local Processor Agency (LPA) and IoT Cloud Agency (ICA). Agents interact both for job classification and resource allocation. The jobs are classified and divided into subtasks at LPA. These tasks are allocated with sufficient resources available in devices and ICA facilitates resources if LPA does not have sufficient resources. To test the performance, the proposed work is simulated using C++. Some of the performance parameters considered are response time, energy consumption and bandwidth utilization.

Published in: 2017 International Conference on Recent Advances in Electronics and Communication Technology (ICRAECT)

Date of Conference: 16-17 March 2017 **INSPEC Accession Number:** 17289604

Date Added to IEEE *Xplore*: 26 October 2017 **DOI:** 10.1109/ICRAECT.2017.22

Publisher: IEEE

ISBN Information:

Conference Location: Bangalore, India

Parabola structure based information gathering using AUV for underwater sensor network

Publisher: IEEE

Cite This

3 Author(s) Neelakanth L. Jadhav ; Ashok V. Sutagundar ; B S. Halkarnimath **View All Authors**

Abstract: This paper intends to provide an energy efficient parabolic structure based information gathering to enhance the network life of Underwater Sensor Networks (UWSN). In UWS... **View more**

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Abstract:

This paper intends to provide an energy efficient parabolic structure based information gathering to enhance the network life of Underwater Sensor Networks (UWSN). In UWSN, sensor nodes closer to the sink node diminish energy sooner since they share larger load of packets relay. This problem worsens when water to be monitored is very deep which is also known as hotspot problem. Hence in this paper an effort has been made to mitigate imbalance in the energy consumption using a parabolic structure. Existing studies deals with multi-hop data transmission in a network. Proposed method creates a parabolic structure in all three layers such as surface layer, middle layer, bottom layer and sensed data is collected at the parabolic head nodes[PHN]. Further data is sent to surface sink node using Autonomous Underwater Vehicle[AUV]. AUV travels in a predefined path to collect the data from parabolic head nodes [PHN] from each layer. Proposed method is to improve the problem of unbalanced energy consumption. Simulation results show that the proposed model effectively and uniformly balances the energy consumption and thereby increasing network lifetime.

Published in: 2017 International Conference on Computing Methodologies and Communication (ICCMC)

Date of Conference: 18-19 July 2017 **INSPEC Accession Number:** 17562662

DOI: 10.1109/ICCMC.2017.8282707

Energy Efficient Dynamic Navigation System

Publisher: IEEE

2 Author(s) Ashok V Sutagundar ; Padmaja Kuruba **View All Authors**

Abstract: In the recent years there is considerable growth in the Vehicular system, driver safety and assistance system. In the current trend, Global positioning system (GPS) is on... **View more**

Metadata

Abstract:
In the recent years there is considerable growth in the Vehicular system, driver safety and assistance system. In the current trend, Global positioning system (GPS) is one such system used for navigation assistance. Cell phone has become a part and parcel of many people in the world today. If both cell phone and GPS receiver are operational, it leads to increase in the cost and energy of navigation. The main objective of this work is to reduce the cost and minimize the amount of energy consumed in the navigation system. In this paper we propose, an energy efficient, high accuracy, low cost navigation system architecture for the dynamic navigation using the existing infrastructure. It has three techniques for accessing location maps for the navigation system namely; (1) uses reservoir as the source of location maps for cell phone (without Internet connection). It uses cell phone as interface between the navigation system and the reservoir. (2) It is assumed that some of the vehicles in Vehicular Adhoc Network (VANET) have location information. In this case cell phone is used as an interface between VANET and navigation system for transmission of location map and (3) cell phone uses Internet as the source of location maps and transfers location map to the navigation system. Proposed navigation system comprises of memory, Graphical User Interface (GUI), audio/visual system and short range Radio Frequency(RF) communication system.

Published in: 2018 Second International Conference on Advances in Electronics, Computers and Communications (ICAECC)

This book presents an approach for energy conservation by optimal sizing of grid connected AC irrigation pumps and a new methodology for sizing SPV powered DC irrigation pumps based on crop water requirements & local hydraulic field conditions. Sizing methodology includes crop water assessment, hydraulic head calculations and assessment of HP rating for irrigation pumps. A case study is taken up in the agriculture lands of Malaprabha Riverbed at Kittali village, Badami Tq, Bagalkot Dst, Karnataka, India (15.8351N-75.5394E) to identify energy conservation potential. Further, detailed analysis and energy conservation assessment is presented.

Basanagouda F. Ronad obtained B.E (2008) & M.Tech (2010) from VTU Belagavi and received Ph.D (2018) from Jain University, Bangalore. His areas of interest are Renewable Energy Applications, Power Electronics and Power Systems. He is working as Professor in Dept. of Electrical & Electronics Engg., Basaveshwar Engineering College(A), Bagalkot, India.

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Solar PV Irrigation Systems

Basanagouda F Ronad
Suresh H Jangamshetti

Optimum Sizing of SPV Irrigation Systems based on Field Conditions

LAP LAMBERT Academic Publishing

Ronad, Jangamshetti

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Basanagouda F Ronad
Suresh H Jangamshetti

Optimum Sizing of SPV Irrigation Systems based on Field Conditions

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Contents

FPGA Based Implementation of Symmetrical Switching in SVPWM for Three Level NPC Converter

Publisher: IEEE

Cite This

PDF

Raghuram L Naik ; Kavita B. Hunasikatti All Authors

Abstract: This paper presents the FPGA based implementation of symmetrical switching strategy in SVPWM for three level NPC converter. A simplified switching strategy is proposed by... **View more**

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Abstract:

This paper presents the FPGA based implementation of symmetrical switching strategy in SVPWM for three level NPC converter. A simplified switching strategy is proposed by exploiting the redundant states of switching vectors available in three level space vector resulting into symmetrical switching sequence. This switching strategy leads to generate switching sequence for all regions of every sector with each switch has to be turned “ON' once in time period resulting into lower device stress and reduced switching loss. The proposed switching strategy is developed using FPGA based Xilinx block sets and tested on hardware test bench consists of Induction motor integrated to the three level Neutral Point Clamped (NPC) converter controlled by FPGA based wavect controller. It is observed from the results, that the complexity of SVPWM for three level inverter is reduced to that of two level inverter and address the problem of narrow pulse width at the midpoint of NPC converter

Published in: 2019 Third International Conference on Inventive Systems and Control (ICISC)

Performance Analysis of Directly Coupled Solar Photovoltaic Powered Irrigation Pumps

Abstract:SPV based irrigation pumps are installed across India. However these irrigation pumps are not widely employed. One of the probable reasons behind this is mismatch of the ... **View more**

Metadata

Abstract:

SPV based irrigation pumps are installed across India. However these irrigation pumps are not widely employed. One of the probable reasons behind this is mismatch of the need and availability of pump ratings to the farmers. Performance results of SPV based pumps vary with solar radiations, hydraulic head offered, pump rating etc. This necessitates the need for actual performance results of pumps and selection criteria. This paper presents the detailed performance analysis of the 0.5HP, 1HP and 2HP directly coupled DC irrigation pumps installed in the Energy park, Basaveshwar Engineering College[A], Bagalkot. The system is employed with pressure sensor, flow rate sensor, speed sensor and suitable software to monitor and document the data. Performance data are logged for every 5 minutes. Results are tabulated and analyzed. Further characteristics of centrifugal pumps are drawn. The presented results can be effectively used for suggesting irrigation pump capacity to farmers.

Design Optimization of Microdisk Resonator Using Interior Point Algorithm

Publisher: IEEE Cite This PDF

Manjula Sutagundar ; B.G. Sheeparamatti ; D.S. Jangamshetti All Authors

Abstract:
This paper presents design optimization of MEMS disk resonator using interior point method. Determining the optimized dimensions of disk resonator for a particular resonance frequency and quality factor along with minimum possible motional resistance is attempted. The algorithm is implemented using MATLAB. The results obtained are compared with a fabricated device. The developed method can provide faster design optimization compared to full wave simulators resulting in significant reduction of design time.

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A Comprehensive Review on Automatic Diagnosis of Diabetic Maculopathy in Retinal Fundus Images

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Abstract. Diabetic Maculopathy (DM) is one of the major problems of diabetes mellitus and it is one of the key reasons for the vision problem. It arises due to the leakage of blood from injured retinal veins. The development of DM is moderate and soundless and it is found in 10% of the world diabetic population. If diabetic maculopathy is not noticed in the underlying stage the effect this on macula is irreversible and can prompt vision loss. Therefore, screening of diabetic eye helps in finding diabetic maculopathy at the beginning stage which prevents the vision loss. In this review paper, the anatomy of the human eye and a brief overview of diabetes, diabetic retinopathy and diabetic maculopathy is presented. The literature review of various methods/techniques used for detection of DM in retinal fundus images and the performance metrics used to measure these methods are discussed in details. Issues involved in DM detection are also mentioned in this paper.

Keywords: Retinopathy (DR) · Diabetic maculopathy (DM) · Optic disc (OD) Hard exudates (HEs) · Blood vessels (BVs)

1 Introduction

The human eye is a fundamental body part associated with vision [1]. Figure 1 demonstrates the retinal anatomical structure. The lens of the human eye helps in focusing light beams onto the retina and iris decides how much light is let into the eye. Optic nerve associates the eye to the cerebrum and conveys the electrical signals framed by the retina to the visual cortex of the mind.

The retina is a sensitive layer situated at the posterior of the eye. Uncountable photoreceptors present in the retina catch the light beams and change them into electrical signals. These electrical signals drive to the brain along the optic nerve where they changed into pictures. Figure 2 exhibits the structure of the retina and its primary parts. The optic nerve is the brightest region of the retina where Blood Vessels (BVs) begin. BVs are responsible for supply of nutrition and oxygen to the retina and it must be normal for the proper working of the retina and macula. The central portion of the macula is called fovea [2].

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Trust Computation Framework based on User Behavior and Recommendation in Cloud Computing

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Abstract*—Cloud computing provides shared environment for different resources and services that are available for users at anytime and from anywhere. Cloud computing has gained considerable attention of users and businesses. However, security concern is one of the major hurdles for acceptance of cloud computing. In order to guarantee security of data, it is necessary to grant access of data, only to authorized users. The traditional system applies different access policies and permission while granting access to any user. The analysis of user behavior is also important aspect, which can be integrated into access control model. In this paper, the trust computation model is presented that takes user behavior into consideration while providing access to the cloud data. The recommendation for the user is also one of the important components to assess user behavior. The proposed model evaluates trustworthiness of user on basis of reputation and recommendation. With the advent in machine learning techniques, applying learning based techniques in security domain has gained lots of popularity. In the proposed method, the machine learning technique (k-means clustering Algorithm) is incorporated in the trust computation process and the users are classified according their trust values.

Keywords*— Cloud computing, Trust, Access control, Machine learning

I. INTRODUCTION

Cloud computing delivers various computing services such as storage, server, networks, analytics, platform, and much more over internet. The cloud users can access different services and use required resources through internet whenever needed. The features like scalability, flexible resources, lower operating cost, efficient management, on demand, increased collaboration, etc. have attracted large number of users and also IT industry. With the development of cloud computing, there is tremendous increase in the amount of data stored on remote servers available in cyberspace through cloud. The cloud computing services are available to users through three service delivery models namely, Software as a Service, Platform as a Service and Infrastructure as a Service. The different ways of cloud deployment are public cloud, private cloud and hybrid cloud. Due to immense benefits of cloud computing, large numbers of users are cultivated to store and share their personal or confidential data using cloud storage services. Also, different organizations and business users employ cloud storage due to better utilization of resources at low cost and easy access. Despite of abundant benefits of cloud computing, the cloud has its share of security concerns [1], [2]. The data security is one of the important concerns, which holds many users and organizations back from adoption of cloud. There are many organizations that are still reluctant to move towards cloud without appropriate assurance about security of their data. The data stored in cloud is outside the physical control of organization or users and it is managed by the third party cloud service providers. Therefore there is always fear of loss of control over the data and this becomes another important barrier for acceptance of cloud. Hence it is necessary to address the security concerns, before storing sensitive data in shared cloud environment.

The user should have necessary credentials to access data in cloud environment. In traditional system, the access permissions are managed by the service providers through some previously defined access control policies. The traditional solutions are not capable to handle the increasing security threats [3]. As cloud infrastructure is completely different than the traditional, the existing security solutions cannot be applied in same form they exist today. Thus, development of more powerful access control mechanisms for data stored in cloud has become important research topic. Due to the multi-tenancy characteristic of cloud, many users do not trust the cloud environment completely. In order to build trust among users and cloud environment, it is necessary to integrate trust mechanics in traditional access control model. Before providing access to any data, along with the necessary credentials, the trustworthiness of user must be evaluated.

In this paper, the trust evaluation framework for cloud user is presented. The trustworthiness of cloud user is evaluated on basis of user's reputation and the recommendations. The reputation is generated on basis of user's behavior. The recommendation for user is submitted by the other users in the system and the cloud service provider. The behavior data and recommendation data is collected by continuous performance

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Detection of Face Spoofing using Multiple Texture Descriptors

Publisher: IEEE Cite This PDF

Shanmukhappa A. Angadi ; Vishwanath C. Kagawade All Authors

Abstract

Document Sections

Abstract:
Automatic face recognition systems are being increasingly developed and deployed in various applications in both civilian and defense sectors. But the emergence of techniques for producing fake face images presents a new challenge and demonstrates high security risks on such systems thus necessitating imposter detection system. Among the numerous imposter detection methods reported in literature, LBP is often used as one of the best local pattern descriptor, as local descriptors are frequently used for imposter detection but the traditional LBP descriptor has the limitation of having small spatial support area and being

Face and Iris Wavelet Feature Fusion through Canonical Correlation Analysis for Person Identification

Publisher: IEEE Cite This PDF

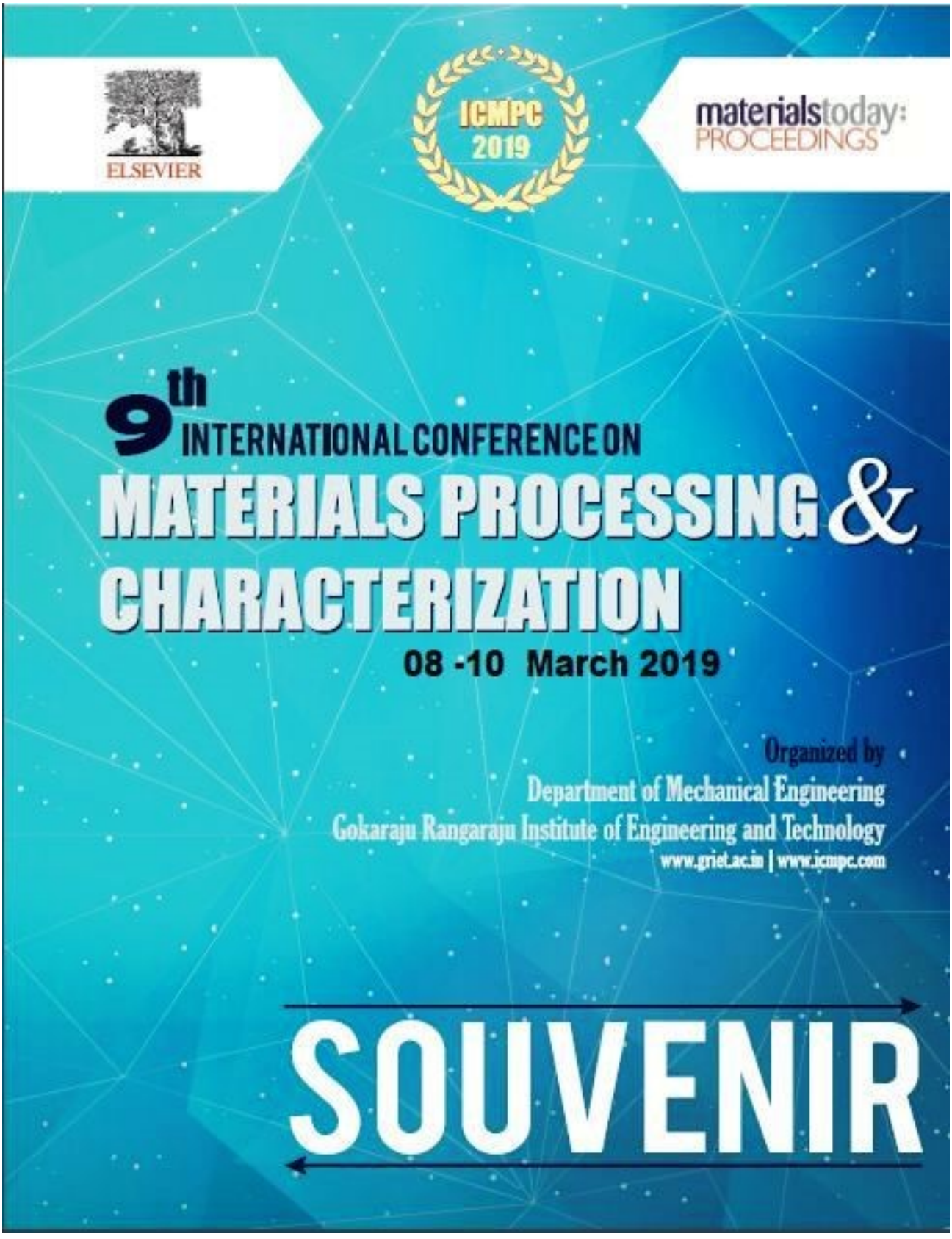
Shanmukhappa A. Angadi ; Vishwanath C. Kagawade All Authors

Abstract

Document Sections

Abstract:
The paper presents, a new technique for person identification using feature level fusion of face and iris biometric features. The fusion technique employed in the proposed work uses wavelet features of face and iris modalities. Canonical Correlation Analysis (CCA) technique is used to fuse face and iris wavelet features. CCA is a technique for extracting linearly correlated face or iris features from set of features of face or iris images. The technique is able to extract and enhance the discriminative power for high dimensional feature space for person identification from multi-feature information of face and iris. The experimental results on both synthetic and genuine multimodal data sets of face and iris features using SVM classifier

Title of the Journal



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Paper first page

9th International Conference on
Materials Processing and Characterization (ICMPC-2019)

Finite Element Based Investigation Of Aluminum Annular For Static And Dynamic Behaviour

Anand C. Mattikalli[a] , Dr. Rajashekar V. Kurahatti[b]
[a]Maratha Mandal Engineering College, Belagavi-590005,India
[b]Basaveshwar Engineering College, Bagalkot-587102,India

Abstract
In the field of machine design static and dynamic analysis plays a vital role. The state of resonance is catastrophic to structural elements, which makes the study crucial; we are endeavoring to shield the natural and working frequencies from coincidence. In the present study endeavor is made to do static investigation of annular plate exposed to a uniform loading and analysis of annular plate for free vibration. For the analysis internal boundary of annular plate is constrained & external boundary is let free. For the analysis of stress, maximum transverse deflection and vibration of annular plate finite element analysis is used and effectively executed. The point of study is to discuss the impact of aspect ratio and thickness on the stresses, deflection and frequency.

Keywords: Annular plate; Free vibration Analysis; Finite element method, Aspect Ratio.

A state of art review on the modeling of Contact type Nonlinearities by Extended Finite Element method

Aazim Shafi Lone[a], Showkat Ahmad Kanth[a], Azher Jameel[b], G. A. Harmain[c]

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Session Chair: *Dr. Moacyr Laruccia, Dr Shivakumar Palaiahnakote*		14:30-15:30
NO	**Title Papers**	**Authors**
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124	Review of Data Integrity In Cloud Storage	Suresh Talwar, S. V. Saboji , C. B. Akki, BEC, Bagalkot, Dayananda Sagar University, Bengaluru INDIA
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Review of Data Integrity In Cloud Storage

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Abstract— *In the past few years' cloud has become the powerful service provider. It provides a way to move the applications and sensitive databases to the large data centres. However there is no guarantee that the data stored in the cloud are secure or not and the contents are original or altered by any unauthorised. Many schemes have been proposed to deal with security issues in an un-trusted server. Integrity of user data in the cloud servers is one of the most important concerns of users nowadays. In this paper we presented few important methodologies and protocols, which the users can use to check the correctness of their data with the simplest possible way and less overhead at the customer side. At the end comparative analysis of data integrity scheme make researcher to take further study in data integrity in cloud.*

Index Terms— cloud storage, integrity, Third Party Auditor (TPA).

I. INTRODUCTION

Cloud computing is growing technology; provide different services like as software service. These services are provided through Internet. Some people buy hard disk and external device USB. Some people prefer to store data on Cloud storage. It allows storing and managing the data remotely, which will easily scale up and down. Users do not have to buy the expensive hardware and manage the data. Users have to pay only for what they use. Nature of the cloud allows accessing the data from anywhere. These makes cloud storage very popular. As cloud is distributed once user uploads the data user has no control over the data. Data are remotely stored. Users do not have physical access to the data. So user is not aware of any security threats at storage. Cloud storage is visualized pools where data and applications are stored who desires to store their data in the cloud. Some of the cloud storage benefits are reduced costs; provide more flexibility, which reduce management of web applications through automated updates, and storage capacity.

Data integrity is defined as the accuracy and consistency of stored data, in absence of any alteration to the data between two updates of a file or records. Cloud services should ensure data integrity and provide trust to the user privacy. Outsourcing data into the cloud is economically attractive for the cost and complexity. It's offering strong assurance of data integrity. Data Integrity is very important among the cloud storage issues. After moving the data to the cloud, owner hopes that their data and applications are in secured manner. But some times the owner's data may be altered or deleted. In that scenario, it is important to verify if one's data has been deleted. To validate data, often user must download the data. If the outsourced data is very large files such downloading to determine data integrity may become prohibitive in terms of increased cost of bandwidth and time, especially if frequent data checks are necessary. Data integrity provides the proofs that data is stored at a remote storage in the cloud is not modified by anyone and there by integrity of the data is assured. Some of the best examples for cloud storage are Amazon S3, Windows Azure Storage, EMC Atmos, Files Anywhere, Google Cloud Storage, Google App Engine Blobstore, and iCloud by Apple.

The remainder of the paper is organized as follows: in section two review of literature survey is presented. Section three describes system models of data integrity. Section four compares the data integrity schemes. We concluded the paper in section five.

II. RELATED WORK

There exist different security problems in cloud computing. Paper [1] proposes the novel security concept of Identity-based Proxy-Oriented Data Uploading and Remote Data Integrity Checking in Public Cloud (ID-PUIC). It formalizes ID PUIC's system and security model. Then, the first concrete ID-PUIC protocol is designed by using the bilinear pairing technique. The concrete ID-PUIC protocol is provably secure and efficient by using the formal security proof and efficiency analysis. Remote data integrity checking is an important security problem. On the other hand, the proposed ID-PUIC protocol can also realize private remote data integrity checking, delegated remote data integrity checking and public remote data integrity checking based on the original client' authorization. Proof of irretrievability (POR) scheme is proposed by Shacham. POR is a stronger model, which makes the checker, not only check the remote data integrity but also retrieve the remote data. Many POR schemes have been proposed.

Paper [2] proposed to ensure data integrity. A TPA can verify data storage correctness on behalf of the client with use of a public key. This key generated during the setup process. This scheme based on homomorphic linear authentication (HLA). The TPA monitors the stored data in the remote server and notifies the client regarding data security. New approach introduce to data integrity. MTPAs are employed to overcome the limitations of a STPA. This scheme applies the concept of POR for large files to archive encrypted data in cloud storage. Remote data-storage-correctness checking scheme based on HLA and ECDSA to support public verifiability. We suggest a remote data storage correctness-checking scheme based on homomorphic linear authentication and an elliptic curve digital signature algorithm to support public verifiability.

Paper [3] investigates data files on un-structed storage, which provide RSA based homomorphic linear authenticator for giving randomly sampling a few block of the file. Thus it may leak user data information to external parties because of their protocol, which is not secure. The Proof of Retrievability Model in which spot-checking and error correcting code are used. A skip list based mechanism which then makes the use of provable data as client request the cloud server to provide service in which cloud server initially authenticate the client and then provide a virtual machine by means of Software as a service. In Virtual Machine RSA is used for secure communication between user and cloud server. SHA-512 algorithm is used for data integrity but problem over here is that performed operation as static configuration, information leaks to the external parties, insecure transmission of data, system requires user data information to the third party which violates the privacy preserving guarantee, single sign on capability to access the cloud data storage.

Paper [4] addresses the challenges and proposes an efficient public integrity-checking scheme for cloud data sharing that supports multiple writers. This prove the security of our design based on the Computational Diffie-Hellman (CDH) problem, the Bilinear Diffie-Hellman (BDH) problem and the t-Strong Diffie-Hellman (t-SDH) problem. This scheme also supports public checking and efficient user revocation and is provably secure. Numerical analysis and extensive experimental results show the efficiency and scalability of proposed scheme. It achieves this through innovative design on polynomial-based authentication tags, which allows aggregation of tags of different data blocks. For system scalability, it is empower the cloud with the ability to aggregate authentication tags from multiple writers into one when sending the integrity proof information to the verifier.

Paper [5] will give a self-certified public auditing scheme for data integrity. Then evaluate its performance in term of basic cryptographic operations and provides intuition behind the construction. Public auditing scheme for data integrity, after data owner outsourced data to the cloud server, it deletes the local copy of these data. A verifier can periodically check the data integrity, the verifier is the auditor in Cloud storage is more and more attractive because it can realize the sharing and storing of data files among companies and corporations. However, for the data owner, the most concern is the integrity of data file. Fortunately, Proofs of Retrievability technique enables the data owners verify the integrity of their outsourced data on the cloud server. Most of the existing POR schemes still exist efficiency.

Paper [6] investigated data privacy issues in remote data integrity-checking protocols. The existing privacy-preserving remote data integrity-checking protocol not achieves the desired goal of leaking and no information to a third party. It formalized zero-knowledge privacy and proposed an improved the protocol to achieve the performance analysis and the implementation, it is observed that all existing protocols with public verifiability supporting data update, proposal require the data owner to

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Routing in Opportunistic Networks: Taxonomy, Survey

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***Abstract*— The accelerated growth of wireless communication such as personal digital assistants, tablets, smart phones, that are carried by the people may arrange themselves in to a special network for the communication of messages. The moving nodes communicate with the nearby nodes using node contact opportunity through Wi-Fi or blue tooth. These nodes suffer from frequent disconnections. The network with frequent disconnections is known as opportunistic network or intermittently connected network. It is a unique wireless network architecture which enables the mobile nodes to have communication with each other in environment where there is no continuous route exists between source and destination .Such networks espouse store-carry-forward habit for the message transfer and utilize mobility of moving nodes for message communication. These networks are featured with network topology which is unstable and also long latency. Routing requires the nearby neighborhood nodes information for the message transfer. Depending on the routing action, we categorize routing schemes as social aware information schemes and social zero information schemes. The schemes such as social zero information do not require any past information of the nodes behavior. Subject to the content of information, social aware schemes are furthermore categorized as microscopic and macroscopic schemes. Microscopic schemes utilize mobile user's movement. Whereas macroscopic schemes have integrated social relationship with the mobile user's movement. We explicate about the routing solutions for the microscopic and macroscopic schemes. Additionally we briefly discussed evaluations in routing schemes.**

Keywords*— *Opportunistic Networks, Intermittently connected network, Store-carry-forward.

I. INTRODUCTION

In the present networking world, wireless communication plays a predominant role. The accelerated growth of mobile devices like laptops, smart phones, notebooks etc makeup mobile communication area a more fascinating research in recent years. Another extension of the mobile has inclined to the Mobile Ad-hoc Network (MANET) model known as Opportunistic Networks (ONs). These networks make use of nodes mobility characteristic, to enter the communication range of each other. This helps to establish communication path between the nodes to transfer the information. ONs suffer from unstable network topology as well as prolonged latency because of frequent disconnections [1]. Such networks suffer from abruptly intermittent connections because of moving nodes. These networks are also entitled by intermittently connected networks. Nodes suffer from the initial knowledge of the structure of the network because of random movement of the nodes. So the routes are created dynamically and relay nodes or intermediate nodes take active part in the transferring of messages to respective destinations. If the intermediate nodes cannot find any forwarding opportunity within its communication range then, the nodes store the messages and carry the messages until they find next upcoming contacts to forward the messages [2]. Using Wi-Fi, Bluetooth, the built in technologies, nodes communicate with each other. The network is accustomed by mobile devices which are carried by human beings and hence routing is a challenging task. The major concern in ONs is reliable transfer of message to the destination. Hence co-operation between the nodes and storage of messages are the primary requirement [3].

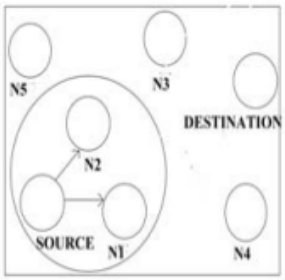

Fig.1 (a)

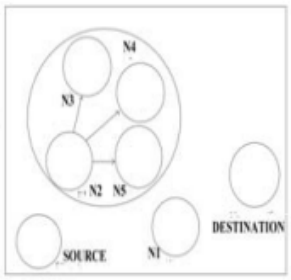

Fig. 1 (b)

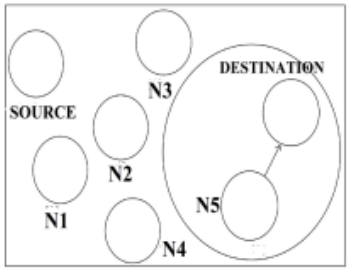

Fig.1 (c)

Fig.1 Message forwarding in opportunistic networks

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S.Thangadurai, Asst. Professor,

National Conference on Advanced Computing and Communication Systems (NCA2CS – 2017) Department of Computer Science
New Horizon College – Kasturinagar - Bangalore

Pose Invariant Face Recognition System – A Review

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Bagalkot
Prof S.M.Hatture
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Bagalkot

Abstract

Face recognition is an important computer vision and pattern recognition technology that is used in various applications like organizing photo albums to surveillance. Face recognition in pose variations is one of the challenges of automatic face recognition, as intra variation caused by pose difference sometimes is better than that caused by distinctiveness difference. However, facial feature changes with pose can be regarded as a continuous process, meaning that a person's face image changes from one pose to another pose gradually. Most of the developed techniques of face recognition are only have capacity of recognizing the frontal views of faces and assuming that the person was looking straight into the camera. The frontal face recognition method is right for certain applications where the client poses constantly the same way from session to session. However, a user might not pose to a camera for the intention of being recognized, definitely not even knowing that a face image is being captured. In these cases it is essential for the system to handle faces with in plane and in depth rotations. Pose invariant face recognition has many real-world applications, specially in creating a more robust recognition system for commercial and government applications.

Keywords

Face recognition, Pose-invariant, Classifier, Datasets

I. INTRODUCTION

Face recognition (FR) is a process in which face of individual is identified by a system. However, identifying faces via as digital eye is not an easy nut to crack. Whenever face recognition is used transversely in the surveillance system it is regularly very difficult to get the faces in restricted environment. Hence the system has to be capable of recognizing the captured faces even in poor lightning conditions and variations in poses as beside the faces taken in restricted environment. Moreover, all the techniques are very much affected by variations and their routine get degraded when pose variations are present. The face

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Performance Evaluation of Fusion Techniques in Biometric Systems-A Review

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Bagalkot
Prof. S. M. Hatture
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Abstract

Biometrics is a discipline of recognizing an individual depends on his / her behavioral or physiological characteristics. Various biometric systems established in real world applications are unimodal which depend on the proof of single source of information for authentication such as face, voice etc. These systems are susceptible to variety of problems. Multiple sources of information for establishing individuality solve some of the limitations of unimodal biometric systems. These systems permit the combination of two or more types of biometric systems known as Multimodal biometric systems. These systems are more reliable due to the presence of multiple, independent biometrics. These systems are capable to meet the rigid performance requirements forced by various applications. Various fusion techniques are available such as Sensor level, score level, feature level, rank level and decision level fusion. It is planned to work on performance evaluation of various fusion techniques by taking into consideration of the multiple biometric traits.

Keywords

Multimodal biometrics, feature level fusion, match score level fusion, Decision level fusion.

I. INTRODUCTION

In the present epoch of information technology, there is a need to realize authentication and authorization techniques for security of resources. There are various ways to prove authentication and authorization. But all other techniques are beaten by biometric authentication. Based on the usage of number of traits, the biometric systems are partitioned into two categories: Unimodal biometric systems (use of only single trait) and Multimodal biometric systems (use of two or more traits or algorithms or samples). Unimodal biometric systems encompass many implicit problems in their applications. Unimodal systems have the lots of limitations like Noisy data, Intra-class variation, Intra-class similarities, Non-

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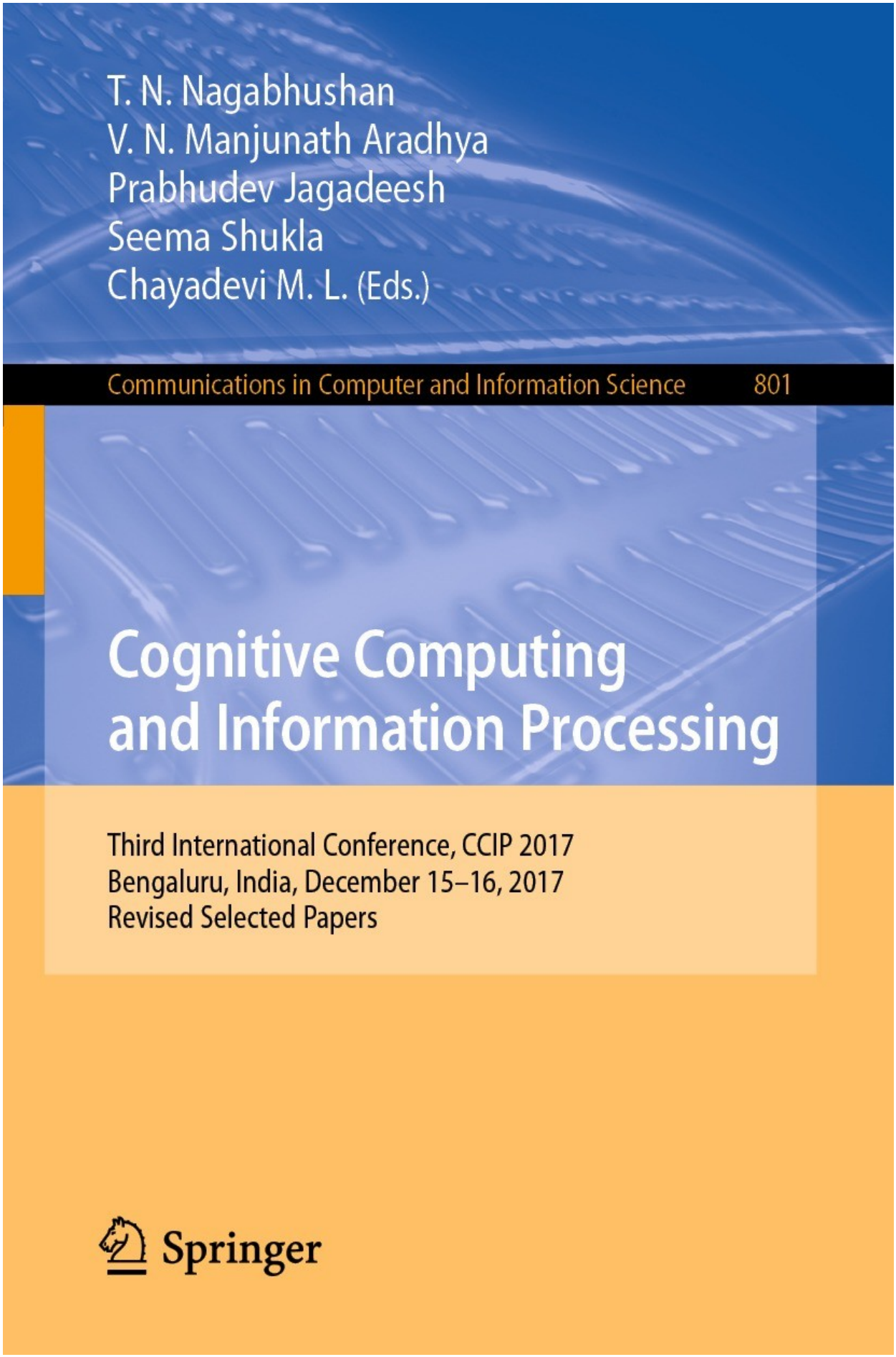
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Text-Dependent Speaker Recognition System Using Symbolic Modelling of Voiceprint

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Abstract. Speaker recognition system automatically recognize/identify a speaker by their combined behavioral and physiological characteristics. A symbolic inference system for text-dependent speaker recognition system by exploring the physiological characteristics embedded in the user utterance is presented in this paper. The inter-lexical pause position, complementary spectral features such as spectral centroid, spectral entropy and spectral flatness, loudness, pitch and formants features are extracted from the voiceprint and symbolic data object is constructed. These features are explored in this work as inter-lexical pause position provides the articulation capability of user vocal tract. The functional properties of the human ear is modelled with spectral characteristics and loudness feature provides the strength of ear's perception. The relation between physical and perceptual properties of sound is estimated through pitch whereas formants provide the acoustic reverberation of the human vocal tract. The variability in features of user/speaker utterance of words is represented with symbolic data. The speaker identification is performed using modified span, content and position symbolic similarity measures [3], modified for the current work. The proposed method is evaluated on 100 users of voice corpus of VTU-BEC-DB multimodal biometric database and achieves an overall identification rate of 90.56%.

Keywords: Speaker identification · Symbolic object · Voice biometric
Complementary spectral features · Symbolic similarity measure

1 Introduction

Speaker recognition system identify an individual by analyzing the human voice. Voice is a biometric trait which exhibits combined behavioral and physiological characteristics used to alleviate the problem of spoof attack in biometric system. Voice of an user is unique as the knowledge/codes used in the utterances are user specific. The physical differences in users' voiceprints are characterized by measuring the amplitude, frequency, duration and spectral distribution. The information embedded in the voice signal is extracted at six different levels such as spectral, prosodic, phonetic, idiolectal (i.e. syntactical), dialogic and semantic [1]. The usage of the text in the testing phase of the speaker recognition system categorize it as text-dependent and text-independent

T. N. Nagabhushan et al. (Eds.): CCIP 2017, CCIS 801, pp. 358–372, 2018.
https://doi.org/10.1007/978-981-10-9059-2_32

Lecture Notes on Data Engineering
and Communications Technologies 9

Nabendu Chaki
Agostino Cortesi
Nagaraju Devarakonda *Editors*

Proceedings of International Conference on Computational Intelligence and Data Engineering

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About this book

The book presents high quality research work in cutting edge technologies and most-happening areas of computational intelligence and data engineering. It contains selected papers presented at International Conference on Computational Intelligence and Data Engineering (ICCIDE 2017). The conference was conceived as a forum for presenting and exchanging

Opinion Content Extraction from Web Pages Using Embedded Semantic Term Tree Kernels

Veerappa B. Pagi and Ramesh S. Wadawadagi

Abstract Rapid proliferation of user-generated content (UGC) published over the Web in the form of natural language has made the task of automatic Information Extraction (IE) a challenging issue. Despite numerous models proposed in the literature to address Web IE issues, still there is a growing demand for researchers to develop novel techniques to cope up with new challenges. In this paper, an approach to extract opinion content from Web pages using Embedded Semantic Term Tree Kernels (ESTTK) is addressed. In traditional tree kernels, the similarity of any two given production rules is determined based on exact string comparison between the peer nodes in the rules. However, semantically identical tree fragments are forbidden, even they can contribute to the similarity of two trees. A mechanism needs to be addressed, which accounts for the similarity of nodes with different vocabulary and phrases holding knowledge that are relatively analogous. Hence, the primitive tree kernel function is reconstructed to obtain the similarity of nodes by searching keywords in opinion lexicon embedded as vectors. Experimental results reveal that ESTTK results in better prediction performance compared to the conventional tree kernels.

Keywords Opinion extraction · DOM tree · Tree kernels · Classification Sentiment analysis

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IoT based Waste Management:An Application to Smart City

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***Abstract*—Emerging Technologies of IoT are transforming slowly with Cities administration. As cities will generate waste at an alaraming rate which needs collection of waste in smarter way, this collection of waste must be within time and trip planning should be done in real time, based on the status of waste. Earlier efforts were on collection of waste with smart bins but garbage collection to their places and plan trip in an optimal path is not much considered. In this paper, proposed IoT technologies with management of waste and trip management in cities is done, so that cost and time are reduced with optimized path for waste collection. Thus proposed effective results for same.**

Keywords— Smart bin, Global Positing System(GPS); Internet of Things(IoT), Ultrasonic sensor, Genetic Algorithm(GA).

I. INTRODUCTION

Internet of Things is a connection of devices. Devices connected to network, transfer data and communicate each other provided with a Unique Identifier (UID), with or without interaction from human to human/human to computer. Automation of human life is goal of an IoT. It's an ever growing Technology connecting sensors, object extends to computing capability and also allowing devices to generate, exchange and data consumption[8].

Urban development is the vision of smart city, to Integrate Information and Communication Technology(ICT) and IoT Technology to remain safe and to manage a city's asset. Smart city includes smart economy, smart people, smart governance, smart environment, smart business, smart living and smart mobility. Smart city provides quality of life[9].

Waste management is a consistently developing issue at local and global levels. Normally, human and animal activities emerge has solid wastes and are futile and undesirable. The residential waste items are gathered through waste bins at a typical place at a specific spot for a road/area. Waste bins checking procedure for waste collection is one of the major troublesome tasks. The typical technique by which, a man needs to wander through the distinctive spots and check the spots for waste accumulation. This is to some degree complex and time consuming process. Presently, waste management system is not as effective as it ought to have been taken over the progressions in the advances and technologies that emerged in the current years. There is no surety about the administration/clearing of wastes at all the spots[10]. To conquer this issue another approach, proposed automated waste management system.

II. LITERATURE SURVEY

Review of papers is carried to know the background, current working procedure and existing system flaws, where we can workout on unsolved problems. A variety of related papers have been reviewed and summarized as follows.

They focus mainly on collection. Current management activity of system and Waste characterization was the main objective to study and to determine[1]. It was demonstrated at thoubal muncipalty, which highlights municipal solid waste management (MSWM) system. And also leaves with suggestions, present management system to be improved which will be useful for authorities to work further also. Smart bin is not used here.

In paper[2] Author introduces technologies like Global Position System, Radio Frequency Identification, General Packet Radio Service, Geographic Information System and web camera are integrated devices. RFID reader device in truck will read both customer and also bin information. Efficient waste collection is achieved. Truck management is also done but is not in optimized way.

Writer of this paper introduces two models of routing they are dynamic and semi static[3]. Further, accumulation of waste in city is done by facilitating IoT a routing model dynamically is designed and in case of tragedy it's robust. Research related to waste collection concentrates on routing and scheduling dynamic design. Though lesser amount of research indicates gathering waste for smarter cities assistance.

Author explains[4] that sensor helps to know the level of garbage at maximum level, Micro- controller acts has interface between sensor and GSM system. GUI is to monitor garbage information for different locations selected. If garbage is not collected when maximum filled message reaches higher authority to take serious action which inturn will help to reduce number of trip for garbage collection and also can reduce expenditure. Collecting garbage is efficiently managed.

This work express to find the shortest route[5] using route algorithm and predictions, which will reduce the work force,

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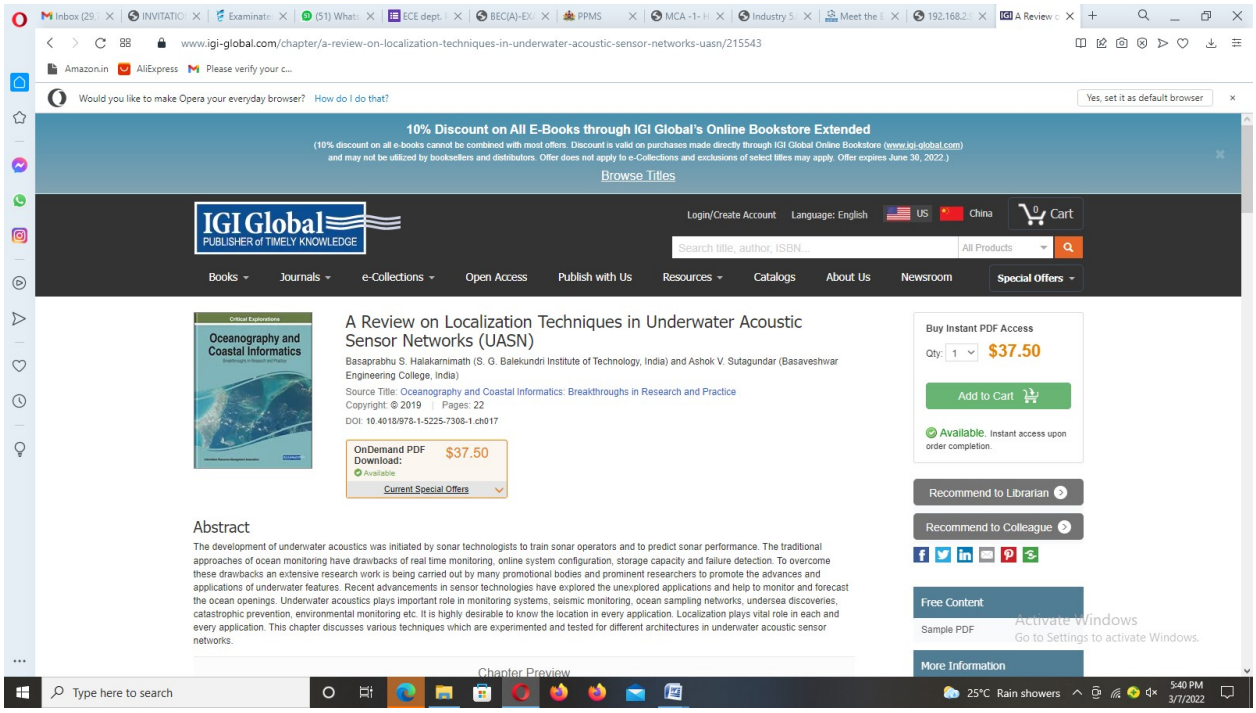
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A Review on Localization Techniques in Underwater Acoustic Sensor Networks (UASN)
Basaprabhu S. Halakarnimath (S. G. Balekundri Institute of Technology, India) and Ashok V. Sutagundar (Basaveshwar Engineering College, India)
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Abstract
The development of underwater acoustics was initiated by sonar technologists to train sonar operators and to predict sonar performance. The traditional approaches of ocean monitoring have drawbacks of real time monitoring, online system configuration, storage capacity and failure detection. To overcome these drawbacks an extensive research work is being carried out by many promotional bodies and prominent researchers to promote the advances and applications of underwater features. Recent advancements in sensor technologies have explored the unexplored applications and help to monitor and forecast the ocean openings. Underwater acoustics plays important role in monitoring systems, seismic monitoring, ocean sampling networks, undersea discoveries, catastrophic prevention, environmental monitoring etc. It is highly desirable to know the location in every application. Localization plays vital role in each and every application. This chapter discusses various techniques which are experimented and tested for different architectures in underwater acoustic sensor networks.
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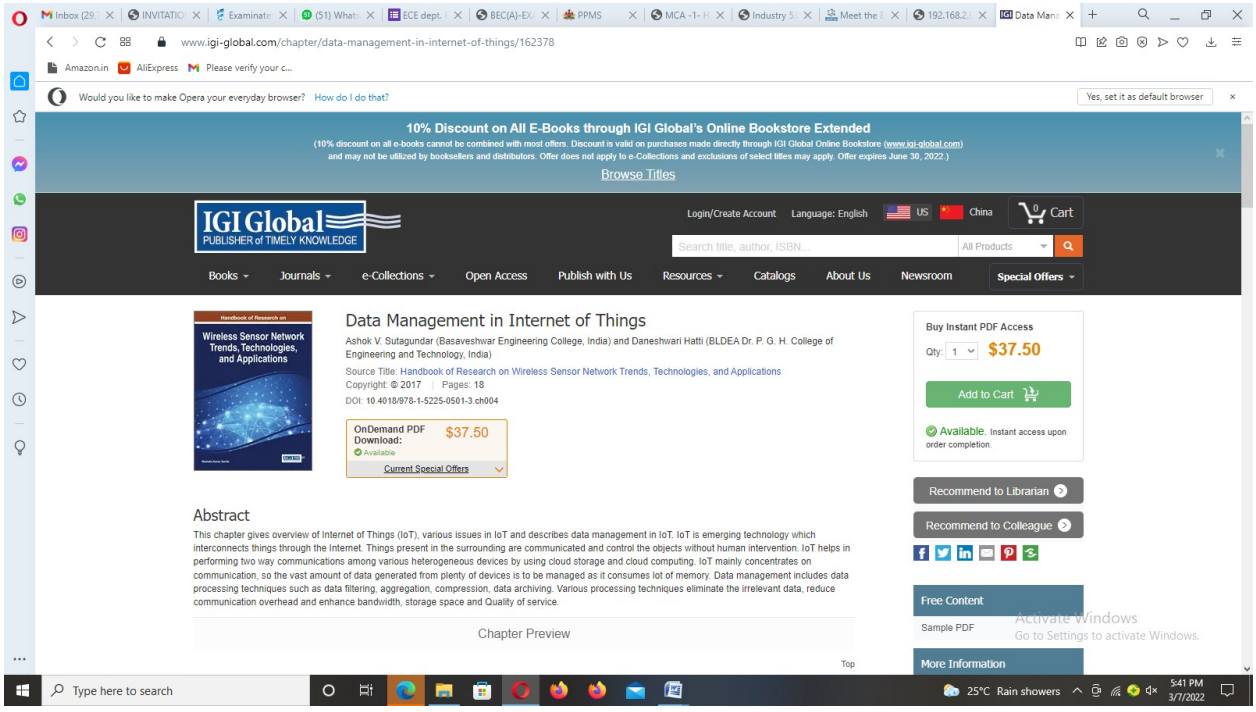
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Wireless Sensor Network Trends, Technologies, and Applications
Data Management in Internet of Things
Ashok V. Sutagundar (Basaveshwar Engineering College, India) and Daneshwari Hatti (BLDEA Dr. P. G. H. College of Engineering and Technology, India)
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Abstract
This chapter gives overview of Internet of Things (IoT), various issues in IoT and describes data management in IoT. IoT is emerging technology which interconnects things through the Internet. Things present in the surrounding are communicated and control the objects without human intervention. IoT helps in performing two way communications among various heterogeneous devices by using cloud storage and cloud computing. IoT mainly concentrates on communication, so the vast amount of data generated from plenty of devices is to be managed as it consumes lot of memory. Data management includes data processing techniques such as data filtering, aggregation, compression, data archiving. Various processing techniques eliminate the irrelevant data, reduce communication overhead and enhance bandwidth, storage space and Quality of service.
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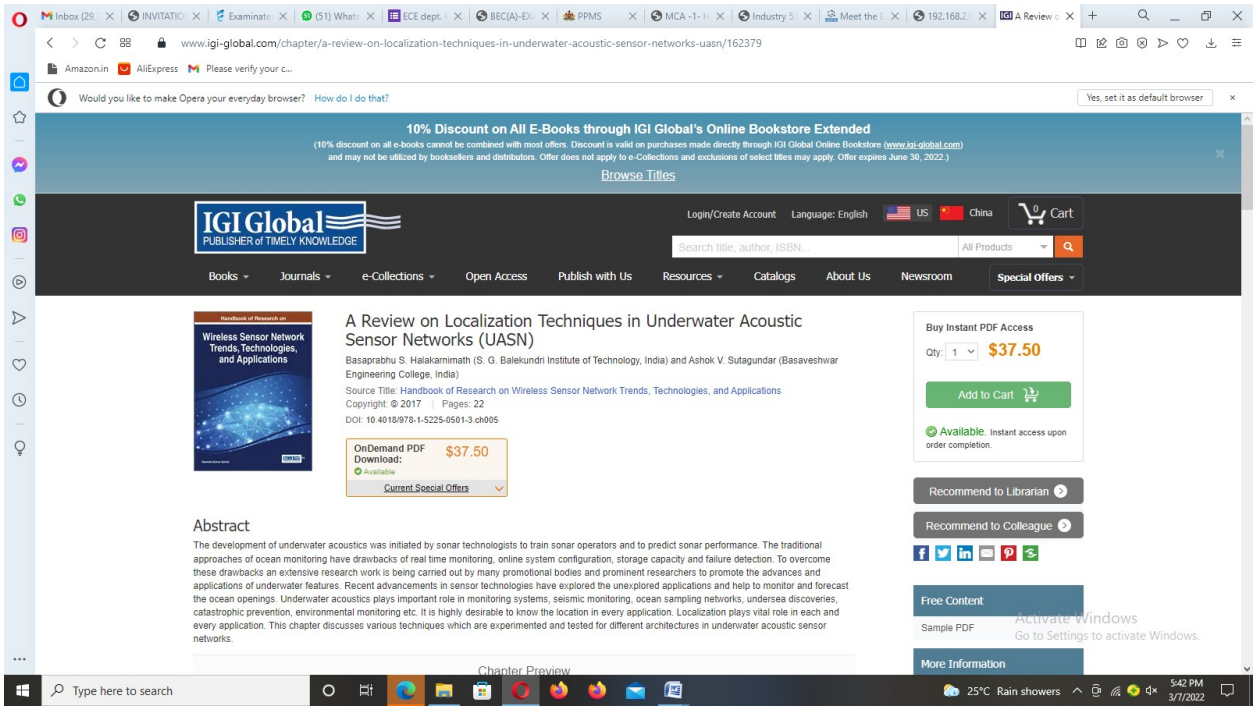
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Abstract
The development of underwater acoustics was initiated by sonar technologists to train sonar operators and to predict sonar performance. The traditional approaches of ocean monitoring have drawbacks of real time monitoring, online system configuration, storage capacity and failure detection. To overcome these drawbacks an extensive research work is being carried out by many promotional bodies and prominent researchers to promote the advances and applications of underwater features. Recent advancements in sensor technologies have explored the unexplored applications and help to monitor and forecast the ocean openings. Underwater acoustics plays important role in monitoring systems, seismic monitoring, ocean sampling networks, undersea discoveries, catastrophic prevention, environmental monitoring etc. It is highly desirable to know the location in every application. Localization plays vital role in each and every application. This chapter discusses various techniques which are experimented and tested for different architectures in underwater acoustic sensor networks.
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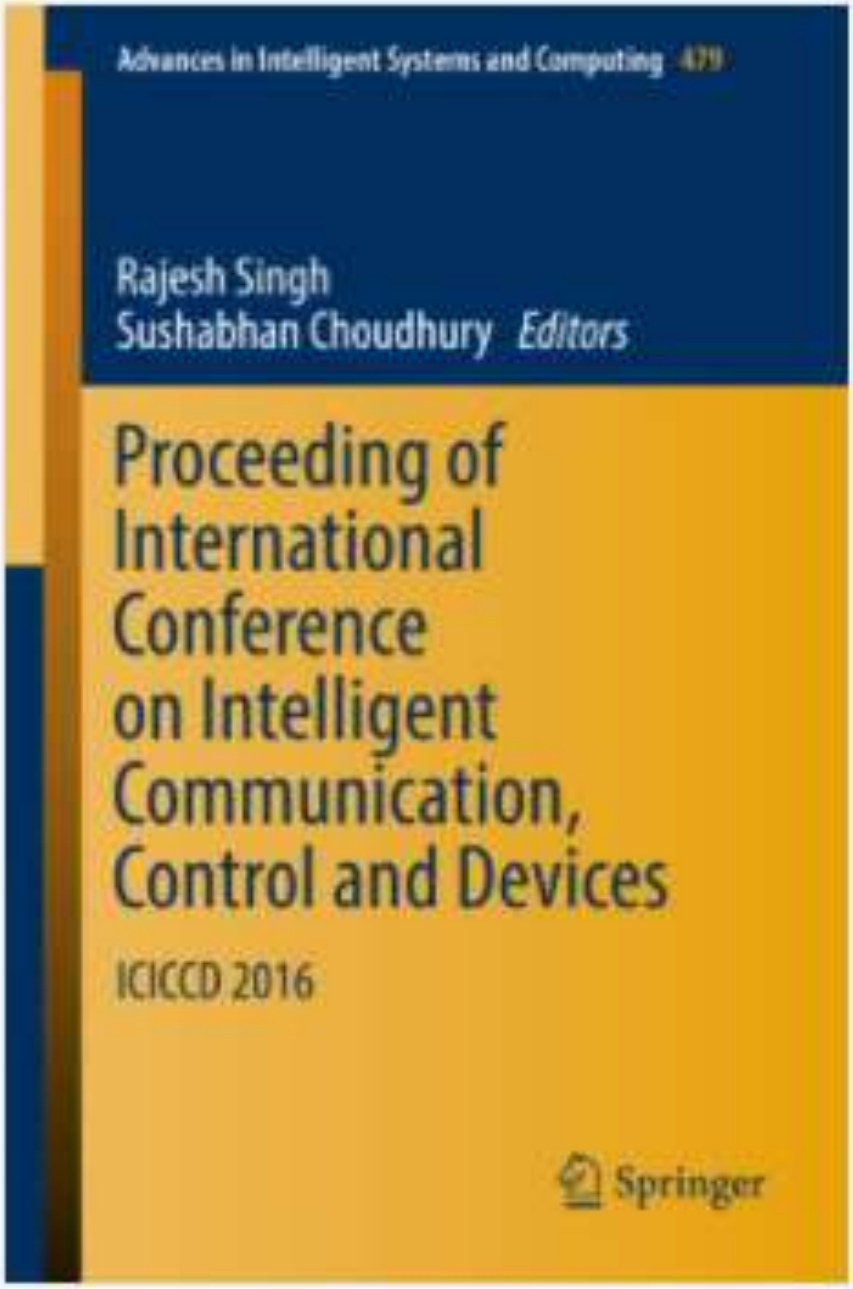
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ANFIS-Based Fault Diagnosis Tool for a Typical Small Aircraft Fuel System

Vijaylakshmi S. Jigajinni and Vanam Upendranath

Abstract In the present paper, an Adaptive Neuro-Fuzzy Inference System (ANFIS) based intelligent diagnosis tool for investigating the health of a typical small aircraft fuel system simulation was proposed. The system was designed for identifying the faults present in the aircraft fuel system and to diagnose those conditions with a proper fuel flow to the engine. The ANFIS intelligent tool works based on the logical rules of an expert system, which are developed as per the engine's fuel consumption and the fuel flow from the tanks. The inputs to train the ANFIS are the fuel flow at the previous instant and the engine's fuel consumption and the corresponding target is the fuel tank's control signals. Training of ANFIS, generates the control signals as per the fuel requirement of the engine and the fuel flow to the tanks. The proposed intelligent controller model was implemented in the platform of MATLAB/Simulink and a comparison with the other techniques allowed the effectiveness of the proposed model.

Keywords Aircraft fuel system · Fuel flow · Fault diagnosis · ANFIS · Fuel tank

1 Introduction

The aircraft industry has an important socio-economic impact on society and world economy [1]. Based on the nonlinear systems, the aircraft systems are proposed as hybrid systems [2]. The normal cooperating systems in an aircraft are specified as, Flight Management System (FMS), Flight Warning Computer (FWC), Display

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LNLCS: Leveraging Network Lifetime using Clock Synchronization in Wireless Sensor Network

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Abstract— **Clock synchronization significantly assists in enhancing the data quality during the data dissemination phase from sensors to the base station. The existing studies towards addressing time synchronization errors don't address the associated latent problems in it. Therefore, this paper introduces a novel technique called as LNLCS i.e. Leveraging Network Lifetime using Clock Synchronization. The technique is a novel attempt to integrate multihop routing with clock synchronization. LNLCS also presents a novel clustering technique that makes the sensor to play multiple roles during data aggregation as well as minimization of clock synchronization errors based on threshold based technique. The outcome of the study was gauged using clock synchronization error and amount of energy being dissipated to find that LNLCS outperforms the most standard and existing clock synchronization errors in dense and large scale WSN.**

Keywords-; Clock Synchronization, Energy Efficiency, Network Lifetime, Routing Protocol, WSN

I. INTRODUCTION

With the advancement of the modern communication system, WSN has been playing a contributory role since more than a decade. A WSN is basically formed from the network established among the sensor nodes [1]. A sensor has the inbuilt capability of sensing a particular form of physical attributes from the surrounding environment. Normally, sensors are used in area where it is quite difficult of human to intervene in the communication system. Various applications of the sensors lie in habitat monitoring, environmental monitoring, industrial applications, healthcare monitoring system etc [2] [3]. Based on the deployment, there are two types of WSN i.e. random-based deployment and uniform-based deployment [4]. The uniform-based deployment lets the user know about the location of the sensors and usually deployed for small area of surveillance. The random deployment is meant for distribution of the sensor when the deployment area is quite large. Based on types, WSN is also classified as homogeneous and heterogeneous WSN [5] [6]. The homogeneous WSN consist of the entire sensor bearing the same physical and networking configuration, whereas heterogeneous network is formed by multiple forms of sensors. According to our observation, we find more research papers inclined towards homogenous sensor network in comparison to heterogeneous sensor network.

The WSN is also shrouded with various problems e.g. routing problems, energy problems, security problems [7] [8] [9]. Out of all the problems, energy problems in wireless sensors are quite critical in nature owing to the close connection between battery lifetime and communication requirements. However, from the data quality viewpoint, there exists another problem which is called as Time Synchronization problems [10]. Basically, a sensor has an inbuilt hardware clock which performs time stamping, i.e. a mechanism to attach time with the outgoing data packets. Time stamping is the best mechanism to understand the freshness of data as well as to understand the data redundancy problems. During data fusion technique, a member node when it forwards a fused data to cluster leader, it is essential that cluster leader must only accept the fused packet with different time stamp. The problem is capturing and processing of data in WSN is done by TDMA scheduling, where there are fair chances of data redundancies [11]. Moreover during intra and inter clustering mechanism, it is essential to incorporate perform time stamping. But normally, the process is inflicted with problems of energy depletion due to spontaneous data dissemination process in WSN. This problem leads to a significant difference of clock time which is called as clock drift and clock offset [10]. Hence, it is essential to perform minimization of clock drift and clock offset using a standard process called clock synchronization. Majority of the experiments done till date have focused on reducing the clock synchronization errors. But it is also significant to understand that there is a close relationship among routing, clock synchronization, and energy efficiency. We do have existing literatures, but they are more or less focused on single problem.

Therefore, this research paper will introduce an analytical technique that jointly addresses multiple hops, clock synchronization errors, and energy depletion. The proposed system is also compared with the existing standard studies towards clock synchronization techniques with respect to synchronization errors and energy consumption. Section II discusses about the existing literatures on the topic followed by discussion of problem identification in Section III that discusses

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Frequency Compression of Speech for Improving Speech Perception in Sensorineural Hearing Loss: FBS Approach

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***Abstract*—Filter-bank summation (FBS) method is a commonly used technique for multi-band processing of speech and audio signals, especially in digital hearing aids. In multi-band speech processing techniques, filter bank summation provides the convenient way of processing the auditory information present in different bands based on their perceptual significance. People with hearing loss have issue in perception of speech due to widening of the auditory filter bandwidth leading to increased frequency masking. Previous studies have shown that spectral splitting of speech signal for binaural dichotic presentation helps to reduce the effect of frequency masking. Also studies showed that using multiband frequency compression it is possible to compensate the effect of widened auditory filters. This paper presents a filter bank summation method to perform dichotic spectral splitting of input speech signal followed by frequency compression to enhance speech perception for hearing impaired. In the present study, the speech signal is split into eighteen frequency bands ranging from 0–5000 Hz based on auditory critical bandwidths and frequency samples of every band compressed in the direction of center of each band using spectral segment frequency mapping technique. Performance of the algorithm was evaluated using MOS test for subjective assessment of speech quality and Perceptual Evaluation of Speech Quality (PESQ) scores for objective assessment of speech quality. The results showed a significant improvement in speech quality as indicated by MOS and PESQ scores for the SNR values in the range of −6 dB to 6 dB.**

***Index Terms*—Sensorineural Hearing Loss (SNHL); Spectral Masking; Filter Bank Summation Method; Dichotic spectral splitting; Frequency Compression.**

I. Introduction

Sensorineural hearing loss (SNHL) occurs when the functioning of the cochlea is affected or when there is dysfunction of the auditory nerve or higher centres in the auditory pathway. The bandwidth of auditory filter normally widened and selection of frequency gets reduced due to masking of spectral components [1], [2]. So SNHL persons have problem in understanding the speech due to broader auditory filters, leading to smoother representation of speech spectrum [3]. This causes poor perception of speech by hearing impaired people.

Hearing loss commonly occurs at higher frequencies. Hearing aid technology provides frequency-dependent amplification for hearing-impaired (HI) persons. Existing hearing devices have a constrained capacity to give adequate gain for high-frequency sounds [4]. This confines the perceptibility of significant sounds, particularly for persons with critical hearing impairment. High frequency components of the speech signal gives essential linguistic information (especially for fricatives) to the listeners.

In frequency transposition [5] method and slow playback high-frequency speech samples shifts to the regions of low frequency by a constant factor These traditional methods of transposition of frequency [6–9] were helpful in recognition of speech, but results in degradation of sound quality. The investigation of the effectiveness of multi-band frequency compression methods using different compression values, to enhance the speech audibility is discussed in [10]. In this method, the spectrum of speech is split into various frequency bands and frequency samples in every band are compressed in the direction of center of band by fixed compression rates. The technique helps in improving the speech quality for hearing impaired people. The work given in [11] reduces the effect of spectral masking using filter bank summation method. A signal is split into 15 frequency sub bands using an analysis filter banks. These 15 frequency bands were designed with sampling frequency of 12 kHz, pass band ripple and stop band attenuation less than 1 dB and 40 dB. These sub band signals were combined by using synthesis filter bank which accomplishes the frequency compression. The problem of masking of spectral components, for listeners with bilateral SNHL, can be reduced with binaural dichotic spectral splitting, using auditory critical bandwidth (ACB) based comb filters [12]. Speech perception can be improved by using a pair of complementary comb filters by adjusting interband crossover gain (between 4 and 6 dB) below pass band gain.

The paper [13] discussed the effect of linear frequency transposition (LFT) and nonlinear frequency compression (NFC) in improving the speech perception for school aged children. Paediatric participants with varying audiometric characteristics such as total distortion of the auditory system, amount of hearing loss, and the usage of hearing aid were considered for evaluating the efficiency of NFC and LFT. The analysis of both the methods was conducted for each subject based on above mentioned levels. The consequences of this examination proposes that LFT and NFC can enhance the perceptibility of high frequency (consonant) sounds and improve understanding

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Cascaded Structure of Wiener Filter with FBS based Spectral Splitting and Dynamic Range Compression For Listeners with Sensorineural Hearing Loss

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Abstract- **This paper presents a cascaded structure of wiener filter followed by spectral splitting using Filter Bank Summation (FBS) method and dynamic range compression with constant compression factor for binaural dichotic presentation. This helps to compensate the effect of spectral masking, reduced dynamic range for moderate sensorineural hearing loss and also improves speech perception in the adverse listening conditions by removing unwanted noise. Wiener filter is used as noise reduction algorithm. Using auditory critical bandwidths, the signal is separated into eighteen frequency bands, varying from 0-5 KHz. Spectral splitting is performed by combing odd and even numbered filter bands and presented to the left and right ears respectively that help in reducing the effect of frequency masking. Amplitude compression using fixed compression factor (0.4, 0.6 and 0.8) in each band was carried out that helps in compensating the reduced dynamic range of the hearing impaired people. Listening tests using Mean Opinion Score (MOS) on normal-hearing subjects were conducted to test the perceived quality of the processed speech. VCV syllable /aba/ and sentences were used as the test material. The results of the listening tests showed that the MOS scores for the processed speech (4.31, 4.06, 3.68, 3.5, 3.067 and 2.612) were higher as compared with those for unprocessed speech (4.48, 1.2, 1.13, 1.06, 0.8 and 0.45) for SNR values of ∞, +6, +3, 0, -3 and -6 dB respectively, indicating the improvement in the perceived quality for different SNR conditions for the compression factor of 0.6. To estimate the intelligibility of the perceived speech, listening test was also carried out on hearing impaired (moderate SNHL) subjects in the presence of background noise using Modified Rhyme Test (MRT).The test material consists 50 sets of monosyllabic words of consonant-vowel-consonant (CVC) form with six words in each set. Each subject is responded for total of 1800 presentations (300 words x 6 different SNR conditions). Results of the listening tests (using MRT) showed maximum improvement in speech recognition scores (23.49 - 27.29%) compared to unprocessed speech, indicating enhancement in intelligibility of the speech at lower SNR values.**

Keywords-Wiener Noise Reduction Algorithm, Filter bank summation (FBS) method, Dynamic Range Compression (DRC), Spectral Splitting, Mean Opinion Score (MOS), Modified Rhyme Test (MRT)

I. INTRODUCTION

Degraded speech perception, increased temporal and spectral masking and reduced dynamic range between threshold of hearing and discomfort level are some of the problems associated with sensorineural hearing impaired people [1]. Furthermore, speech intelligibility gets reduced in the presence of background noise. Therefore hearing impaired people need a higher signal-to-noise-ratio (SNR) to effectively communicate.

Noise reduction in hearing aids is a very challenging issue because the properties of the noise signal change significantly with time. Hence it is very difficult to develop an algorithm that works in different listening environments. The nature and properties of noise sources are very important in deciding which noise reduction algorithm works well to enhance speech signal by eliminating the noise from the corrupted signal. Some of the noise reduction schemes applicable for hearing aids are spectral subtraction, wiener filter, and beam former approaches [2] [3] [4]. Comb filter pairs (with complementary magnitude responses) were used to enhance the intelligibility of perceived speech for bilateral hearing (moderate SNHL) impaired subjects [5].

Dynamic range Compression can be implemented in either within a single frequency band or multiple frequency bands i.e., multiband compression. Hearing aids employing dynamic compression split the signal into number of frequency bands, and amplitude compression is carried out in these bands. Filter bank summation technique (FBST) is used for multiband amplitude compression [6] to partly compensate the effect of reduced dynamic range for the people with sensorineural hearing loss. Therefore it is essential for hearing aids to improve speech perception under adverse listening conditions, and also to overcome the effects of reduced dynamic range and spectral masking effect associated with SNHL listeners.

Hence in our proposed work, we have cascaded wiener filter followed by spectral splitting using Filter Bank Summation (FBS) method and dynamic range compression using constant compression factor. Wiener filter obtains the enhanced signal by optimizing the mean square error criteria. In FBS method, frequencies ranging from 0-5000Hz are partitioned into 18 bands, depending on auditory critical bands. Each band is amplitude compressed with the constant compression factor of 0.4, 0.6 and 0.8. Spectral splitting of compressed speech is carried by combining odd numbered and even numbered filters and presented them to two ears.

Rest of the paper is organized as follows. Related works are discussed in section II. Proposed algorithm is given in section III. Tests and Result analysis are given in section IV. Spectrographic analysis is discussed in section V. Finally, section VI concludes the work.

II. RELATED WORKS

Many studies have investigated the different signal processing techniques to overcome the problem of SNHL

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Improved Cluster Head Selection in LEACH Algorithm for Heterogeneous Wireless Network using NS2

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Abstract— **With the fast development in wireless applications, services and devices, used in a single radio technology such as a second generation (2G) and third generation (3G) wireless technology may not be efficient to deliver data with high speed and services related to quality for mobile users in a seamless way. The next generation wireless systems (Heterogeneous Wireless Network (HWN)) are being formulated with the image of heterogeneity, where a mobile user will be able to access multiple wireless networks. Coupling the high data rates of IEEE 802.11-based MANETs and the wide coverage area of 3G networks (e.g., UMTS), this paper explain MANET-UMTS integrated network architecture. Mobility management is required to provide seamless mobility. In this scheme we consider the cluster based LEACH algorithm for Ad-hoc network, where Cluster Head (CH) is defined. But if CH is moved from cluster, then entire cluster becomes unused. So we define the new CH and its position in such a way that it can improve parameters like throughput, energy consumption, stability and configuration time. We design proposed scheme and implemented with certain simulation parameters using Network Simulator (NS-2) tool.**

Keywords: Cluster Head (CH), Heterogeneous Wireless Network (HWN), LEACH, Mobility Management, NS-2

I. INTRODUCTION

This From the history, the progress of wireless communication brings handiness to our routine life. Moreover, various wireless communication networks have been used globally across different location so that, users can converse with others and access the internet seamlessly [1, 2]. Therefore, wireless network must provide ubiquitous communication capability and information access regardless of user's location. There are many wireless terminals used with respect to the requirements and the features of networks, among them can be categorised according to their transmission rate and coverage area. The Wireless Local Area Network (WLAN) operate at Mbps rate (typically 1~2Mb/s) over a range of hundreds meters (typically 150~250 meter using IEEE 802.11b protocol). The dynamism of LAN has different effect such as reconfiguration [3]. The popular 3G network has the coverage in the range of several kilometers with the transmission rate of about 200~300 kbps or higher. Furthermore, the Mobile Ad-hoc Network (MANET) is another wireless communication network without infrastructure [4, 5]. It is characterized by dynamic topology with node mobility and limited bandwidth. Each mobile node will function as both host and router. It send the packet to other nodes using one-to-one communication [6].

· We propose Heterogeneous network which is the hybrid network of 3G cellular network and MANET. It extracts the features of the area coverage from 3G system and the high data rate in Mobile Ad-hoc network. We also analyze the mobility management to provide seamless mobility. For this we considered the cluster based Leach algorithm for Ad-hoc network, where CH is moved then entire cluster becomes unused. So we define the new CH in such a way that it has been repositioned (reconfigured) with same old CH position, so that parameters like throughput, energy consumption and stability should be improved, and we also calculate the settling time (reconfiguration time) for new node where it is joining the new cluster.

II. RELATED WORK

In Clustering technique, mobile nodes of network system arrange themselves into hierarchical structures [3, 7]. Using clustering, mobile nodes can use the limited network resources such as bandwidth, battery energy efficiently. In individual cluster, aggregation of data and fusion are done by cluster-head, to decrease the amount of data forwarding to the Base Station. Cluster creation is usually performed based on residual energy of nodes, stability and selection of cluster-head [1]. Normal nodes select their CH right after employment and transmit data to the CH. The function of CH is to send its own data and external data from different nodes to the base station after doing fusion and aggregation of data. LEACH is one among the hierarchical protocols for routing in wireless networks. The scheme proposed in LEACH has encouraged many other protocols.

In no paper they are discussing about the movement of CH itself from the cluster. But in our proposed scheme we

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FPGA-Based Design of a Hearing Aid with Frequency Response Selection through Audio Input

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***Abstract*—Hearing aids provide frequency-selective amplification to compensate for the elevated hearing thresholds and automatic volume control to partly compensate for the significantly reduced dynamic range of hearing. The response selection controls of these devices are not easy to access during their normal use. To address this problem, an FPGA-based design of a hearing aid is presented, with frequency response selection by DTMF coded sound from a hand-held device without using switches, ports, or additional hardware. The audio input is given to two parallel processing blocks. The first block is a DTMF detector employing Goertzel algorithm and outputs control bits for selecting one of the pre-stored responses. The second block processes the signal for frequency-selective amplification and produces the audio output. The filter is designed as an FIR filter with its magnitude response approximating the product of the responses required for hearing-loss compensation and noise attenuation. It is efficiently realized using a processing architecture employing sequential multiply-accumulate operations. The design is implemented using FPGA "Altera Cyclone IV EP4CE115F29C7" and an audio codec and verified for satisfactory operation.**

Keywords*—DTMF detector; FPGA based signal processing; hearing aid.

I. Introduction

Persons with sensorineural hearing loss experience degraded speech perception and find it to difficult to adapt to different listening conditions. The currently available digital hearing aids provide frequency-selective amplification to compensate for the elevated hearing thresholds and automatic volume control to partly compensate for the significantly reduced dynamic range of hearing [1]. They generally have a set of filter responses to partly compensate for the different adverse listening conditions and for suppressing significant spectral components of the noise. However, the selection controls are not easy to access during their normal use. As optical and RF links require additional hardware in the device and are not useable when it resides in the ear canal, an audio controlled selection can be of great help to the hearing aid user.

For reducing the size and power, hearing aids are designed using ASICs and an FPGA-based prototyping and testing is helpful in significantly reducing the development time and nonrecurring cost [2]. Hence, an FPGA-based design of a hearing aid is presented, with the response selection by dual-tone multi-frequency (DTMF) coded sounds from a hand-held device. The control signal is input through the same microphone, pre-amplifier, and ADC as used for speech. Goertzel algorithm-based DTMF detection [3]–[5] is used as it is not affected much by speech and environmental noise.

II. Design and Implementation

Realization of hearing loss compensation filter as a parallel bank of IIR band-pass filters, with adjustable gains to obtain the desired magnitude response, results in nonlinear phase response. FIR filter design, although requiring a relatively higher order, permits coupling an almost arbitrary magnitude response with a linear phase response. We use a linear-phase FIR filter, with the magnitude response approximating the product of the responses required for hearing-loss compensation and noise attenuation. A single filter helps in reducing the signal delay. The loss compensation response is obtained from the audiogram, by linear interpolation of the gains desired at the audiometric test frequencies. Four noise attenuation responses are devised: neutral or all pass (AP), low pass (LP) with 6 dB/octave tilt above 2 kHz to suppress high-frequency noise, high-pass (HP) with 6 dB/octave tilt below 500 Hz to suppress low-frequency noise, and band-pass (BP) as a cascade of LP and HP. The sets of filter coefficients are calculated by iterative application of frequency sampling technique and are stored. The set of coefficients for the appropriate response is selected through DTMF coded sounds from a handheld device.

The design is implemented using an FPGA board with audio codec "WM8731" and FPGA "Altera Cyclone IV FPGA EP4CE11529C7". The audio input with sampling frequency of 10 kHz is applied, as shown in Fig. 1, to two parallel processing blocks: (i) DTMF detector with output control bits for selecting one of the pre-stored set of filter coefficients and (ii) FIR filter for frequency-selective amplification.

A DTMF signal is a sum of two harmonically unrelated tones, one from four "row" frequencies and the other from four "column" frequencies. The DTMF detector, shown in Fig. 2, has a set of four Goertzel filter blocks for row frequencies and another such set for column frequencies, each with a second order IIR filter and 250-sample energy calculation. The detector generates 2-bit row and 2-bit column output. Only 4 out of 16 codes are used at present. The bits are applied as input to the ROM containing four sets of filter coefficients each consisting of 513 coefficients.

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Design of an Optimized Piezoresistive Pressure Sensor for a Pressure Range of 0 to 1 MPa

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ABSTRACT

The design of the piezoresistive pressure sensor considers the geometry of the membrane, size, shape and placement of the piezoresistor on the surface of the diaphragm. when pressure is applied, it is converted to output voltage by the pizoresistros which are connected in wheatstone bridge form. this paper describes the optimum techniques to enhance the performance of the sensor. Sensitivity can be enhanced by placing the PZR on proper location and selecting geometry of the sensor. Deflection of diaphragm, change in the output voltage and sensitivity are the various parameters used for the analysis of the designed sensor. The simulation results show a highest sensitivity of 0.016μV/V/kPa.

Keywords: Optimum, pressure sensor, Piezoresistive, Sensitivity, Comsol multiphysics.

I.INTRODUCTION

MEMS devices like pressure sensors have modified the way that application engineers and system designers measure pressure. The ease of use, ruggedness, ,low cost and small size allow these sensors as an application in medical as well as industrial and automobile process control and portable products. A pressure sensor basically consists of a sensing element (diaphragm) and certain transduction mechanism such as capacitive, piezoelectric, Piezoresistive, etc.

Pressure sensors can be classified in terms of pressure ranges they measure, temperature ranges of operation, and most importantly the type of pressure they measure. Pressure sensors are variously named accordingly to their purpose, but the same technology may be used under different types. The three different categories of pressure measurements are Absolute sensor, Gauge pressure sensor and Differential pressure sensor. Pressure sensors can also be classified depending upon the pressure sensing technology based on transducer used: there are many types of pressure sensors available based on transducer used such as Capacitive pressure sensor, Piezoelectric pressure sensor, Resonant pressure sensor, Piezoresistive pressure sensor, etc., which have been widely used in recent times. Based on the study, in capacitve sensor, a capacitance to voltage conversion is required, resulting in added electronics. Fabrication of capacitive pressure sensors is more complex, more susceptible to electromagnetic interference. Nonlinear relationship between the capacitance and the displacement, hence require force-balancing and linearization electronics to be fabricated. Similarly resonant pressure sensors are complicated in processing, they need to be packaged them in a vacuum to maintain high quality factor. While the piezoelectric pressure sensors are not suitable for static pressure sensing because piezoelectric materials only respond to changing strains.

When compared with piezoresistive mechanism, it has mature fabrication process, linear operation for different pressure ranges, simple read out circuitry, can be made highly sensitive. Hence this paper includes mechanism of Piezoresistive transduction because of it's simple fabrication and measurement.

II.LITERATURE SUEVEY:

Various articles on Piezoresistive pressure sensor has been studied with respect to their sensing mechanism, sensing pressure, material, pressure range, merits and demerits.

Sensitivity Enhancement of Piezoresistive Pressure Sensor with Meander Shape Piezoresistor

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***Abstract*—Amongst various transduction principles of pressure sensor, piezoresistive method provides high sensitivity and linear operation over a wide range of pressure. In this paper, piezorestive transduction mechanism is employed for design of a pressure sensor. The diaphragm of the proposed sensor is designed using n-type of Si with copper material used as a connecting arms for the p-type meander shaped piezoresistors placed on the surface of the diaphragm in a Wheatstone bridge configuration at the high strain region of the diaphragm. Meander shape piezoresistors of different length are simulated, in order to find out the best configuration for high sensitivity and linearity. The proposed design is analysed to study the deflection of the diaphragm and output voltage across the bridge. Results reveal that the 50 μm length of piezoresistors is found to have the best sensitivity.**

***Keywords*—Pressure sensor; Meander shape piezoresistors; Linearity; Sensitivity.**

I. INTRODUCTION

Micro pressure sensors were the first MEMS based devices to be fabricated. So far about 18% of the MEMS based devices available in the world are pressure sensors [1]. MEMS pressure sensors work on the principle of the mechanical deformation of a thin diaphragm due to the pressure exerted by the contact medium. The mechanical stress induced due to the applied pressure is converted into an electrical signal using piezoresistive, capacitive, optical and resonant sensing mechanisms. Among the various transduction mechanisms available for the sensor, piezoresistive type is the most widely used due to various advantages such as good linear input/output relationship, high reliability, small size, easy integration with electronics, simple compensation circuitry and a well matured fabrication process

Piezoresistance is the phenomenon of change in resistivity of certain materials (like silicon, polysilicon, SiC etc.) on application of stress/strain [2]. Piezoresistive pressure sensors employ this principle to measure the applied pressure. Piezoresistive sensors also have much higher sensitivity than the metal strain gauges which work on the basis of change in resistance due to geometrical deformation. Meander shape of piezoresistive pressure sensor configuration constitutes an important part to a pressure sensor market. These types of sensors are helpful in placing the entire length of the piezoresistors inside the long and narrow high stress regions and they are used mainly because of their high sensitivity and good linearity.

Piezoresistive pressure sensors employing the use of silicon, poly silicon as piezoresistive materials, because of its high sensitivity and repeatability. Pressure sensors employing the use of other materials like SiC, and diamond for piezoresistors are not very popular for commercial usage because the fabrication technology is not mature for such materials [3]. Also silicon based piezoresistors can be easily fabricated using ion implantation and the sheet resistance of the resistors can also be carefully controlled using ion implantation. In this work, we will discuss the design methodology and simulation of a meander shape piezoresistive pressure sensor based on piezoresistance in silicon.

II. LITERATURE SURVEY

S Santosh Kumar et.al [4] discusses the silicon piezoresistive pressure sensor for barometric applications in the range of 0 to 1.1 bar pressure. When a pressure is applied on the diaphragm with four piezoresistors, the stress induced

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Design of Piezoresistive Pressure Sensor for Enhanced Sensitivity

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Abstract— **Piezoresistive pressure sensor is a significant transduction mechanism for measuring pressure due to the fact that it is simpler to integrate with electronics, its response is more linear, they are inherently shielded from RF noise and fabrication is easy compared to other transduction mechanism. In this paper, piezoresistive transduction mechanism is employed for design of a pressure sensor. The diaphragm of the proposed sensor is designed using n-type Silicon with p-type Silicon piezoresistors placed on the surface of a diaphragm in a Wheatstone bridge configuration at the most sensitive region of the diaphragm. The proposed design is analyzed to study the deflection of the diaphragm and the output voltage across the bridge. The effect of change in piezoresistor length on the output voltage is also investigated. The results reveal that the proposed sensor provides highest sensitivity for the piezoresistor length of 50um.**

Keywords— **Piezoresistance; Pressure sensor; Sensitivity; Stress**

I. INTRODUCTION

A pressure sensor measures pressure, typically of gases or liquids. Pressure is an expression of the force required to stop a fluid from expanding, and is usually stated in terms of force per unit area. Semiconductor sensors are widely used in current measurement systems because of their low cost, small size and easy integration with electronic circuits [1]. In the automotive industry, for example, mechanical semiconductor sensors have become very widespread, especially those intended for the measurement of pressure and acceleration [2].

Pressure sensors can be classified based on the transduction mechanism such as capacitive, piezoresistive, optical, resonant, Thermal sensors. In piezoresistive pressure sensor, the piezoresistive effect is a change in the electrical resistivity of a piezoresistive material when mechanical strain is applied. In contrast to the piezoelectric effect, the piezoresistive effect causes a change only in electrical resistance, not in electric potential. The mechanism is in conducting and semi-conducting materials, changes in inter-atomic spacing resulting from strain affect the band gaps, making it easier for electrons to be raised into the conduction band. This results in a change in resistivity of the material.

The sensors combine the excellent mechanical properties and piezoresistive effect of single crystal silicon and related process technologies of integrated circuits. In order to enhance the piezoresistive effect and also the sensitivity of the sensors, a thin diaphragm is formed by silicon micro machining technology so that the stress resulting from applied pressure is concentrated on the piezoresistors located on the diaphragm. Piezoresistive pressure sensors are used in a wide variety of applications including tire pressure meters, pressure gauges, pressure switches, blood pressure monitoring, process control and automobile parts, etc.

The design of piezoresistor is vital in determining the performance of pressure sensors. In view of that, this paper proposes Piezoresistive pressure sensor with a Different length of piezoresistors to examine the enhance in sensitivity and linearity of pressure sensor.

II. LITERATURE SURVEY

In this section we discuss about the papers on piezoresistive pressure sensor with respect to pressure sensing mechanism, materials used for the design of the sensor, parameters used for analysis, pressure sensor range, merits and demerits of the work.

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Design Simulation and Analysis of Piezoresistive Micro Pressure Sensor for Pressure range of 0 to 1MPa

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Abstract: **In this work, we present the design, simulation and analysis of piezoresistive micro pressure sensor operable at pressure range of 0 to 1MPa. Piezoresistors are placed and are connected in the form of Wheatstone Bridge, on the diaphragm. For the design and simulation various aspects like diaphragm dimensions, placement of piezoresistors, dimensions of piezoresistors and different shapes of piezoresistors have been considered to find the best possible configuration for better sensitivity. Simulation and analysis for all the parameters mentioned above has been done using Finite element method based COMSOL Multiphysics. Simulation results show that the sensor design with two-turn meander configuration with the dimensions mentioned in the paper provide better sensitivity 35.54 mV/V/MPa over the pressure range of 0 to 1MPa.**

Keywords: Micro Pressure Sensors, Piezoresistive, Pressure Range, COMSOL/Multiphysics, Sensitivity, Linearity.

I. INTRODUCTION

MEMS Pressure sensors are the first commercially successful devices. Pressure sensors are used in many applications such as, industry, automotive, chemical, oil fields and water treatment etc. Conventional pressure sensors are replaced almost completely due to their advantages viz., small size, low cost, ease of fabrication, high reliability, less stray factors. Based on the method of sensing micro pressure sensors are classified as absolute, differential and gauge sensors and based on transduction mechanisms, mechanism like capacitive, piezoelectric, resonant and piezoresistive have been reported [1]. Amongst the various transductions mechanisms, piezoresistive mechanism is widely preferred because of its ease of fabrication, high reliability, better sensitivity, high linearity, simple voltage readout and compensation circuitry [2]. Micro pressure sensors design and miniaturization has been changed considerably after finding the piezoresistivity in silicon and germanium [3-4]. Semiconductor piezoresistive pressure sensors provide high sensitivity then the metal strain gauges, because of their high gauge factors. Piezoresistive sensors explore the piezoresistive effect, where the resistance of piezoresistors changes with applied pressure. Silicon based micro piezoresistive pressure sensors are very popular because of many advantages of silicon. Silicon can be easily doped and controlled to develop required piezoresistors and their resistivity. In this paper we explore design, simulation and analysis of MEMS based piezoresistive pressure sensors using silicon over a pressure range of 0 to 1MPa. COMSOL simulator has been used for the simulation. Piezoresistors are placed and are connected in the form of Wheatstone Bridge, on the diaphragm. For the design and simulation various aspects like diaphragm dimensions, placement of Piezoresistors, dimensions of Piezoresistors and different shapes of Piezoresistors have been considered to find the best possible configuration for better sensitivity and linearity. Meander shape has been explored to enhance the sensitivity of the designed sensor [5].

II. PIEZORESISTIVE MICRO PRESSURE SENSOR

Typical piezoresistive pressure sensor (PPS) consists of a diaphragm most of the time made up of silicon, on top of which four Piezoresistors (usually formed by controlled doping of silicon) are either embedded or placed (deposited). Then each of the piezoresistors are connected in the form of Wheatstone bridge. The simple diagram is shown in fig. 1. For the configuration shown in fig. 1, pressure is applied on the diaphragm, which will deflect. The deflection causes stress on the piezoresistors and results in change in the resistance, which will be further sensed by the bridge. Diaphragm dimensions, size and Piezoresistors dimensions, shape and placement are very important design considerations. Burst pressure, sensitivity and linearity are important performance parameters of the sensors.

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LPC Based Speech Recognition for Kannada Vowels

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***Abstract*— Automatic speech recognition (ASR) is most promising area which is of special attention today. This paper proposes speech recognition system for Kannada vowels. The proposed framework consists of preprocessing unit and classification unit. The preprocessing unit segments the speech signal into proper frames and extracts the features using Linear Predictive Coding (LPC). The Kannada vowels are classified into the proper classes in the classification unit where Euclidean distance is used. The recognition accuracy obtained is about 40 %.**

Keywords*— *Linear Predictive Coding*; *Mel frequency cepstral coefficients*; *Isolated Word Recognition

I. INTRODUCTION

Speech recognition is used to translate words spoken by humans to a machine understandable format. The recognition process is still a challenging research area because existing methods are not fast and precise enough compared to human recognition abilities. Keyboard acts as a barrier between computer and the user which is true in rural India. This barrier can be overcome by speech recognition system. There is a difficulty in implementing ASR because different regions peoples of Karnataka have different speaking style, accents, and different voice patterns. Along with these challenges, the presence of background noises, changing of signal properties over time and differences between the training and testing environments also pose major problems in speech recognition [1]. The speech signals are continuously changing in nature, which also affects the speech recognition process. In case of isolated word recognition, signals are recorded in intervals. The signal is preceded by silence and followed by silence therefore the speech segment need to be separated from non speech segment i.e. silence region because this requires storage space and increased computation time. This paper proposes an approach for identifying isolated words corresponding to Kannada vowels. The isolated speech recognition system is divided into three parts. The first part is to develop the database of spoken words. The second part deals with the extraction of features. Finally the third part helps in classification of the spoken words. Literature survey, proposed work, analysis of results and conclusions and outlines are discussed in the following sections.

II. LITERATURE SURVEY

The wavelet packet based Kannada speech recognition is discussed in paper [2]. Wavelet Packet Decomposition (WPD) is a speech compression technique. This method yields four ets of WPD coefficients. A Mel frequency cepstral coefficient (MFCC) is the feature extractor that was used to compute the coefficients from WPD coefficients and Euclidian distance was used to classify the speech. 90 % of accuracy was achieved using Daubechies8, 5-level decomposition technique. Paper [3] presents an Isolated Word Recognition (IWR) system for identification of spoken words. MFCC was used as feature extractor and SVM was used as a classifier. This developed system was tested and evaluated with a performance of 79% accuracy.

In paper [4], a statistical technique was used to remove the silence from the speech signal. This method was used to identify the minimum speech patterns that are required while creating the training set of the speech samples. MFCC was used as a feature extractor and Vector Quantization (VQ) was used as classifier. The recognition error rate was decreased from 2.59 to 1.56 in the case of VQ1 clustering algorithm and 2.5 to 1.45 for VQ2 algorithm. Also the speaker dependent error recognition rate was decreased from 2.5 to 1.45.

A Kannada isolated digit recognition system using MFCC as feature vector was discussed in paper [5]. The system was designed to recognize isolated Kannada numbers. Hidden Markov Model (HMM) was used as recognizer. An average efficiency of 90 % was achieved. Sarika Hegde, *et. al.* have designed speech recognition system as Multiple Classifier System (MCS). MFCC is used as feature extractor and HMM and Support Vector Machine (SVM) classifiers are used where both of which are trained separately with the same training dataset [6]. While testing, each of these classifier tests the data in parallel. The combined classifier takes the final decision which also combines the technique of Dynamic Time Warping (DTW). An automatic phoneme recognition system based on Gaussian Mixture Modeling (GMM) which is a static modeling scheme is presented in paper [7]. 15 Kannada phonemes were used to train and test the model. Gaussian multivariate model was used to recognize an unknown phoneme from the testing database from the given MFCC for each class by calculating the mean and covariance matrices of corresponding phoneme sequences.

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Comparative Analysis of Different Micro-Pressure Sensors Using Comsol Multiphysics

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Abstract: **Amongst MEMS technology, pressure measuring technology is one of the most important parameter, which is measure of force per unit area. In this work a comparative analysis of different pressure sensor mechanisms is carried out. Capacitive pressure sensors work on the principle of electrostatic transduction mechanism, piezoresistive pressure sensor employs a change in resistance values of piezoresistive elements placed on the surface of the diaphragm. The piezoelectric pressure sensor works based on piezoelectric effect, where the sensing element is stressed due to the applied pressure, positive electric charge is generated which in turn results to induced voltage. The simulation and modeling of proposed pressure sensors is done using COMSOL Multiphysics. Based on simulation results, capacitive pressure sensor exhibits non-linear response. Piezoresistive pressure sensor provides high linearity and better sensitivity. Piezoelectric pressure sensors achieve high sensitivity but are applicable to only dynamic pressure conditions.**

Keywords: Pressure, Capacitive pressure sensor, Piezoresistive pressure sensor, piezoelectric pressure sensor, Linearity, Sensitivity

I. INTRODUCTION

Pressure is inevitable used in many industrial and day to day life applications. There is always increasing need for pressure measurement techniques. MEMS based Pressure sensors are highly popular in the domain of pressure measurement due to their reliable and accurate measurements. Pressure (P) is defined as the force applied per unit area which is given by,

$$P = F / A$$

Where F is force applied and A is the area where the force is applied.

MEMS pressure sensor converts mechanical into electrical signal based on particular transduction mechanism.

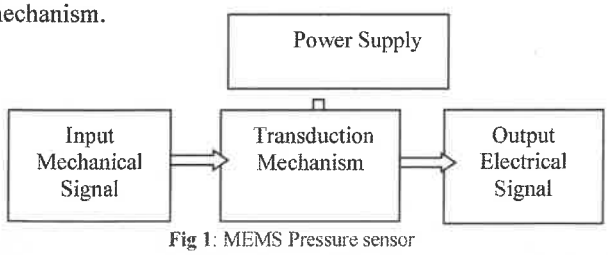

Fig 1: MEMS Pressure sensor

The figure 1 shows the basic MEMS Pressure sensor. The pressure sensors have their wider application in the field of automotive industry, bio-medical and weather forecasting.

A. TYPES OF PRESSURE SENSORS

The pressure sensors can be classified based on different parameters. The pressure sensors classified based on their sensing element are as follows.

a) Capacitive Pressure Sensor
b) Piezoresistive Pressure Sensor
c) Piezoelectric Pressure Sensor

a) Capacitive Pressure Sensor

This Pressure sensor works based on the principle of electrostatic transduction mechanism. The design of the pressure sensor consists of pair of parallel diaphragms separated by dielectric medium in between them. Capacitive pressure sensor when subjected to pressure, the upper diaphragm bends and the distance between the diaphragms changes hence, change in capacitance can be observed, which is given by,

$$C = \varepsilon_o \varepsilon_r A / D$$

Where, C – capacitance, ε_o- dielectric constant, ε_r – relative permeability, A-area of the plate, D- Distance between two parallel diaphragms.

b) Piezoresistive pressure sensor

Piezoresistive pressure sensor works based on Piezoresistive effect. Pressure sensor when subjected to mechanical strain the effective mass of silicon atoms either increase or decrease which in turn changes the mobility of the silicon carriers, hence the resistance(R) of the material changes which is given by,

$$R = \rho l / A$$

Where, A-cross-sectional area of the piezoresistive material, *l*-length of the piezoresistive material, ρ- Resistivity of the material.

The piezoresistive pressure sensor consists of silicon diaphragm with piezoresistive elements mounted on it. Silicon is used as sensing element. The Piezoresistors are placed in the form of Wheatstone bridge circuit on the

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Routing in Opportunistic Networks: Taxonomy, Survey

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Abstract— **The accelerated growth of wireless communication such as personal digital assistants, tablets, smart phones, that are carried by the people may arrange themselves in to a special network for the communication of messages. The moving nodes communicate with the nearby nodes using node contact opportunity through Wi-Fi or blue tooth. These nodes suffer from frequent disconnections. The network with frequent disconnections is known as opportunistic network or intermittently connected network. It is a unique wireless network architecture which enables the mobile nodes to have communication with each other in environment where there is no continuous route exists between source and destination .Such networks espouse store-carry-forward habit for the message transfer and utilize mobility of moving nodes for message communication. These networks are featured with network topology which is unstable and also long latency. Routing requires the nearby neighborhood nodes information for the message transfer. Depending on the routing action, we categorize routing schemes as social aware information schemes and social zero information schemes. The schemes such as social zero information do not require any past information of the nodes behavior. Subject to the content of information, social aware schemes are furthermore categorized as microscopic and macroscopic schemes. Microscopic schemes utilize mobile user's movement. Whereas macroscopic schemes have integrated social relationship with the mobile user's movement. We explicate about the routing solutions for the microscopic and macroscopic schemes. Additionally we briefly discussed evaluations in routing schemes.**

Keywords— Opportunistic Networks, Intermittently connected network, Store-carry-forward.

I. INTRODUCTION

In the present networking world, wireless communication plays a predominant role. The accelerated growth of mobile devices like laptops, smart phones, notebooks etc makeup mobile communication area a more fascinating research in recent years. Another extension of the mobile has inclined to the Mobile Ad-hoc Network (MANET) model known as Opportunistic Networks (ONs). These networks make use of nodes mobility characteristic, to enter the communication range of each other. This helps to establish communication path between the nodes to transfer the information. ONs suffer from unstable network topology as well as prolonged latency because of frequent disconnections [1]. Such networks suffer from abruptly intermittent connections because of moving nodes. These networks are also entitled by intermittently connected networks. Nodes suffer from the initial knowledge of the structure of the network because of random movement of the nodes. So the routes are created dynamically and relay nodes or intermediate nodes take active part in the transferring of messages to respective destinations. If the intermediate nodes cannot find any forwarding opportunity within its communication range then, the nodes store the messages and carry the messages until they find next upcoming contacts to forward the messages [2]. Using Wi-Fi, Bluetooth, the built in technologies, nodes communicate with each other. The network is accustomed by mobile devices which are carried by human beings and hence routing is a challenging task. The major concern in ONs is reliable transfer of message to the destination. Hence co-operation between the nodes and storage of messages are the primary requirement [3].

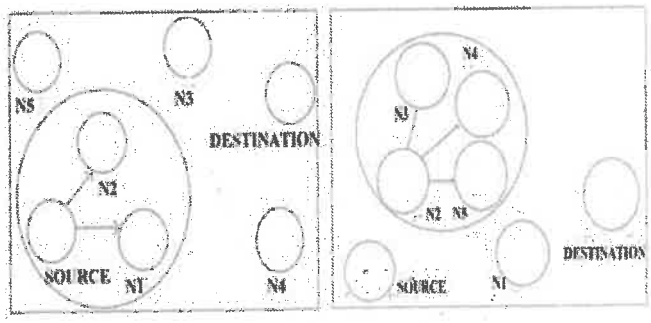

Fig.1 (a) Fig. 1 (b)

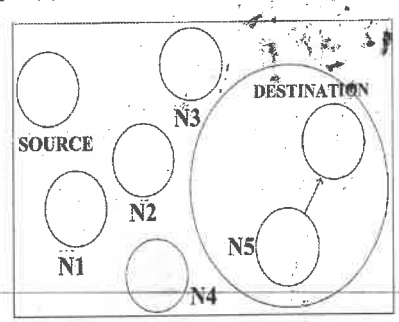

Fig.1 (c)

Fig.1 Message forwarding in opportunistic networks

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BDI Agent based Routing Scheme in VANETs

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***Abstract* — Vehicular Ad hoc Networks (VANETs) are a class of wireless networks built dynamically in an ad hoc network manner. VANET is a key technology for smart and Intelligent Transportation System. Efficient and intelligent algorithms for routing in VANETs are critically required for safety information propagation. Routing in highly dynamic VANET topology is important for the achievement of any vehicular safety applications. The routing mechanism in vehicular networks is critical because of VANETconstraints such as unpredictable network topology, frequent disconnections, varying network densities, etc. Multi agent scheme based routing scheme for VANETs is addressed in the paper. We address the challenge of how to route the data with short communication delay, overhead, and the complexity. Specifically, we consider the scenario for (V2V) vehicle-to-vehicle communication. Multi agent scheme consists of static agent and mobile agents. The scheme operates as follows: (1) establishing a connectivity pattern between the vehicles; (2) creating a set of beliefs; (3) desire development; (4) finalizing the intention. We validate the proposed scheme by simulation. Evaluated simulation results are packet delivery ratio, bandwidth utilization, and route identification delay.**

Index Terms- VANETs, V2V, Routing, Multi-Agent System

I. INTRODUCTION

The VANETs are best example for (MANETs) mobile ad hoc network. Modern vehicles with capability of sophisticated computing and communication are a good sign for Vehicular Adhoc Networks (VANETs). VANETs communicate with IEEE 802.11p, were communication is conceivable between vehicles and road side infrastructure. Design of systematically organised VANET environment improves the motorway safety and optimizes the traffic conditions. Auto collision happens because of heavy traffic on the road. These accidents and other incidents on the roads occur due to absence of safety and other necessary services information. Overcrowding of vehicles results in heavy delay of information for the travellers and creates harmful to the environment on the roads. Valid safety data related issues are given most noteworthy priority in VANETs data aggregation, validation and dissemination. In VANETs, efficient routing protocols should address the issues such as unpredictable topology, density of vehicles, mobility, heterogeneous communication environment, etc. are discussed in papers [1] – [7].

Execution assessment of the distinctive vehicular framework circumstances is appeared in [8] [9]. Both topologies based routing algorithms and position-based routing are assessed in urban and city situations. Dynamic security and smart transportation are essential applications of VANET are presented in [10]. The paper additionally gives a point by point overview of routing mechanisms and mobility prototypes which are reasonable for efficient V2V and V2RSU communication.

The results of the paper [11] show that multicast routing algorithms, including geocast and mobility based, are more convincible than other routing algorithms. In paper [12] the researchers showed the recent taxonomy of the routing protocols for VANETs. The paper [13] gives a review of VANETs plus opens current challenges in routing issues, primarily paper focus on V2V communication. Finally author summarise the strength and limitations of different classes in routing protocols.

The investigation in paper [14] is predominantly on the review of new outcomes of the routing schemes in VANETs. The difficulties and viewpoints of routing protocols are finally discussed by author. The author proposes multi agent based approach for intelligent information propagation in VANETs. The paper [15] explained information dissemination using software agents in VANET.

Aggregation of critical information and minimization of redundant data dissemination can efficiently done by regression based cognitive agent approach is presented in [16]. DSDV protocols performance can be improved by using agent based approach is basically discussed in [17].

Paper [18] investigates that the conventional and customary routing algorithms of MANETs and proved that efficiency is less in VANETs due to VANETs architecture and environment. Multi agent system approach improves the efficiency of the routing protocol. A vehicular information ad-hoc network that consists of three tier network architecture using multi agent system offers adaptability, versatility and viability for movement of data in VANETs and also supports hearty and deft system administration [19].

A framework for keen learning and choice making techniques to build smart, intelligent and centralized traffic management model is proposed and discussed in [20], further paper shows a cognitive radio enabled VANET for multi-agent based ITS. The scheme demonstrates two model for data trade, one is dynamic (V2V) and another is semi-dynamic (V2RSU).

Static and mobile software agents to address the traffic problem in city and urban areas are discussed in [21]. Agent based approach results in best QoS in VANET and also provides the safety information to the drivers for comfort driving in accident prone areas.

A software agent is a software entity to function autonomously in a continuous inputs environment. Belief-Desire-Intention agent architecture represents agent three key mental structures: enlightening states of mind around the world (beliefs or convictions), motivational approaches

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Review of Microscopic and Macroscopic Routing Algorithms in Opportunistic Networks

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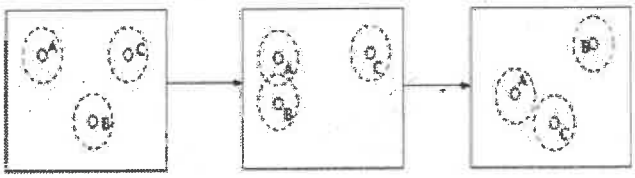
Abstract— **Opportunistic networks are highlighted with long latency and unstable network topology. It is a unique wireless network architecture which enables the mobile nodes to have communication with each other in environment where there is no continuous route between source and destination. In this network scenario there is no continuous routing path exist between source and destination. Using intermediate nodes information is conveyed to the destination. These networks espouse capture - move-forward behavior arising from the mobility of the mobile nodes for message relying. In this article we explicate about the challenges of the opportunistic networks, classification of routing protocols, also confer about the metrics required for the performance measurement of routing algorithms. For the message transfer, routing requires information about the neighborhood nodes. Based on routing behavior, we classify routing protocols as social zero information schemes and social aware information schemes. Social aware information schemes are further classified into microscopic schemes and macroscopic schemes depending upon content of the information. In this paper we discuss some of recent microscopic and macroscopic routing protocols and also confer the comparison among the reviewed algorithms.**

Keywords—Opportunistic Networks, Routing,Mobility pattern

I. INTRODUCTION

In our daily life, wireless communication plays an important role. Recent progress in wireless technologies such as 3G, 4G, and Bluetooth, Wi-Fi, another advancement of the Mobile has given rise to Ad-hoc Network (MANET) model called Opportunistic Networks (ONs). ONs are challenged MANETs and are characterized by opportunistic connectivity i.e. data is forwarded opportunistically whenever contact between the nodes take place. ONs are one of the types of Delay Tolerant Networks (DTNs) that are highlighted with long latency and unstable network topology. Due to the node mobility, these networks may have unexpectedly intermittent connections. So these networks are also called by intermittently connected networks.

ONs are one of the interesting advancements of MANETs where the nodes do not have any prior knowledge about the structure of the network. In such scenario routes are built dynamically and the communication between mobile nodes are enabled via the intermediate nodes called as relay nodes. When no forwarding opportunity exists within its transmission range intermediate node captures the message and waits for the upcoming contacts to forward the information. ONs are also called as Packet Switched Networks (PSN) i.e. networks formed by people carrying mobile devices [1]. Fig. 1 illustrates an example how routing in ONs take place to transfer the messages between disconnected nodes. We referred node B as source and node C as destination. In fig.1 (a) node B initially carries the message and fig. 1(b) node B relays the message to node A since it is in node's B proximity. Then message is delivered to destination node C when node A encounters node C in fig.1(c).



(a) Initially B carries message (b)B relays message to A (c) Finally message is delivered to C

Fig. 1 Routing in opportunistic network

One of the important and compelling challenges in opportunistic networks is to find routes from source-destination, because of the lack of direct connectivity between the node pairs for transferring of message. The routing protocols in ONs are classified into infrastructure-less protocols and infrastructure based protocols [2]. The routing protocols should provide maximum delivery ratio, minimum overhead ratio, minimum cost, minimum delivery delay, maximum route quality, maximum node popularity etc. In this paper we review the recent progress in opportunistic networks routing/forwarding protocols. The organization of the paper is as follows. The challenges of Routing in opportunistic networks are described in Section 2. Section 3 reviews the related work. In section 4 we compared the performance parameters of reviewed protocols and section 5 describes few applications of opportunistic networks. Conclusion is depicted in section 6.

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LPC Based Speech Recognition for Kannada Vowels

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***Abstract*— Automatic speech recognition (ASR) is most promising area which is of special attention today. This paper proposes speech recognition system for Kannada vowels. The proposed framework consists of preprocessing unit and classification unit. The preprocessing unit segments the speech signal into proper frames and extracts the features using Linear Predictive Coding (LPC). The Kannada vowels are classified into the proper classes in the classification unit where Euclidean distance is used. The recognition accuracy obtained is about 40 %.**

Keywords*— *Linear Predictive Coding*; *Mel frequency cepstral coefficients*; *Isolated Word Recognition

I. INTRODUCTION

Speech recognition is used to translate words spoken by humans to a machine understandable format. The recognition process is still a challenging research area because existing methods are not fast and precise enough compared to human recognition abilities. Keyboard acts as a barrier between computer and the user which is true in rural India. This barrier can be overcome by speech recognition system. There is a difficulty in implementing ASR because different regions peoples of Karnataka have different speaking style, accents, and different voice patterns. Along with these challenges, the presence of background noises, changing of signal properties over time and differences between the training and testing environments also pose major problems in speech recognition [1]. The speech signals are continuously changing in nature, which also affects the speech recognition process. In case of isolated word recognition, signals are recorded in intervals. The signal is preceded by silence and followed by silence therefore the speech segment need to be separated from non speech segment i.e. silence region because this requires storage space and increased computation time. This paper proposes an approach for identifying isolated words corresponding to Kannada vowels. The isolated speech recognition system is divided into three parts. The first part is to develop the database of spoken words. The second part deals with the extraction of features. Finally the third part helps in classification of the spoken words. Literature survey, proposed work, analysis of results and conclusions and outlines are discussed in the following sections.

II. LITERATURE SURVEY

The wavelet packet based Kannada speech recognition is discussed in paper [2]. Wavelet Packet Decomposition (WPD) is a speech compression technique. This method yields four ets of WPD coefficients. A Mel frequency cepstral coefficient (MFCC) is the feature extractor that was used to compute the coefficients from WPD coefficients and Euclidian distance was used to classify the speech. 90 % of accuracy was achieved using Daubechies8, 5-level decomposition technique. Paper [3] presents an Isolated Word Recognition (IWR) system for identification of spoken words. MFCC was used as feature extractor and SVM was used as a classifier. This developed system was tested and evaluated with a performance of 79% accuracy.

In paper [4], a statistical technique was used to remove the silence from the speech signal. This method was used to identify the minimum speech patterns that are required while creating the training set of the speech samples. MFCC was used as a feature extractor and Vector Quantization (VQ) was used as classifier. The recognition error rate was decreased from 2.59 to 1.56 in the case of VQ1 clustering algorithm and 2.5 to 1.45 for VQ2 algorithm. Also the speaker dependent error recognition rate was decreased from 2.5 to 1.45.

A Kannada isolated digit recognition system using MFCC as feature vector was discussed in paper [5]. The system was designed to recognize isolated Kannada numbers. Hidden Markov Model (HMM) was used as recognizer. An average efficiency of 90 % was achieved. Sarika Hegde, *et. al.* have designed speech recognition system as Multiple Classifier System (MCS). MFCC is used as feature extractor and HMM and Support Vector Machine (SVM) classifiers are used where both of which are trained separately with the same training dataset [6]. While testing, each of these classifier tests the data in parallel. The combined classifier takes the final decision which also combines the technique of Dynamic Time Warping (DTW). An automatic phoneme recognition system based on Gaussian Mixture Modeling (GMM) which is a static modeling scheme is presented in paper [7]. 15 Kannada phonemes were used to train and test the model. Gaussian multivariate model was used to recognize an unknown phoneme from the testing database from the given MFCC for each class by calculating the mean and covariance matrices of corresponding phoneme sequences.

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A Survey of Speech Recognition on South Indian Languages

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Abstract— **Automatic Speech Recognition is an active field of research to identify speech patterns for providing the equivalent text. Many types of interactive software applications are available and the uses of these applications are limited due to language barriers. Therefore development of speech recognition systems in local languages will help anyone to make use of this technological advancement. This paper presents a brief survey of Automatic Speech Recognition System of south Indian Languages and discusses the advances made in the recent years of research and compares some of the well known methods used in various stages of speech recognition system of south Indian languages.**

Keywords— Speech Recognition; Feature Extraction; MFCC; Support Vector Machine; RBF kernel; Hidden Markov Model; Neural Network; Dynamic Time Warping.

I. INTRODUCTION

Speech recognition is the translation of spoken words into text. It is also known as Automatic Speech Recognition (ASR), computer speech recognition or just Speech To Text (STT). Speech recognition system performs two fundamental operations: signal modeling and pattern matching. Signal modeling represents a process of converting voice signal into a set of parameters. The signal modeling involves four basic operations: Spectral shaping, feature extraction, parametric transformation, and statistical modeling. Spectral shaping is the process of converting the voice signal to a digital signal and emphasizing important frequency components in the signal. Feature extraction is a process of obtaining different features such as power, pitch, and vocal tract configuration from the speech signal. Parameter transformation is the process of converting these features into signal parameters. Statistical modeling involves conversion of parameters to observation vectors [1, 2]. The pattern matching approach involves two essential steps namely, pattern training (this is the method by which representative sound patterns are converted into reference patterns for use by the pattern matching algorithm) and pattern comparison. The essential feature is that it uses a well-formulated mathematical framework and establishes consistent speech pattern representations for reliable pattern comparison from a set of labeled training samples via a formal training algorithm. A speech pattern representation can be in the form of a speech template or a statistical model, and can be applied to a sound, a word or a phrase. In the pattern comparison stage of the approach, a direct comparison is made between the unknown speech patterns with each possible pattern learnt in the training stage, in order to determine the identity of the unknown according to the goodness of match of the patterns.

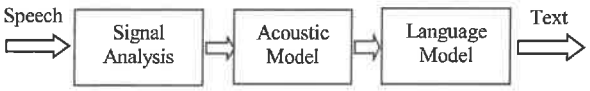

Fig.1: Basic Block diagram of speech recognition

Figure 1 shows different stages of Automatic Speech Recognition System. The microphone will pick up the analog signal and convert it into electrical signal and is passed to a processing unit called as signal analyzer (feature extractor), which processes the speech signal. The acoustic model compares the phonemes with the previous results from the trained models and highest probability match of a phoneme is selected as being the correct phoneme. Language model consist of two parts Dictionary file and Grammar file. Dictionary file matches the phoneme patterns to particular words and decides the correct pattern for the user input. Grammar file is made up of many templates which map the process of conversation that is made of limited number of paths which allows the Language Model to match a sentence to the user's response i.e Text output [3, 4].

A. Types of speech recognition

Speech recognition systems can be classified as:

- Isolated word recognition

Isolated word recognizers usually require each utterance to have quiet on both sides of the sample window. It doesn't mean that it accepts single words, but does require a single utterance at a time. This is fine for situations where the user is required to give only one word responses or commands, but is very unnatural for multiple word inputs. It is comparatively simple and easiest to implement because word boundaries are obvious and the words tend to be clearly pronounced which is the major advantage of this type. The disadvantage of this type is choosing different boundaries affects the results.

- Connected word recognition

In connected word systems separate utterances are 'run-together' with a small pause between them.

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BDI Agent based Dynamic Routing Scheme for Vehicle-to-Vehicle Communication in VANETs

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***Abstract*—Design of routing protocols to send message for safety applications in VANET is an essential and required issue to support smart and intelligent transportation system. This paper aims to design and develop a dynamic routing scheme for Vehicle-to-Vehicle (V2V) communication in VANET under the constraints such as dynamic topology, unpredictable vehicle density, link failure etc., using Belief-Desire-Intention (BDI) model of cognitive agent. The proposed dynamic routing scheme works as follows: (1) collecting the information such as end-to-end delay and available bandwidth; (2) generation of beliefs based on the collected information; (3) develop the desire based on the belief; (4) select the route if desire is achieved and intention is executed; and (5) reselect the route if intention is not executed. Proposed routing scheme is analyzed in-terms of network life time and packet delivery ratio.**

***Index Terms*—Vehicular Ad hoc Network (VANET); Cognitive agent; BDI model**

I. Introduction

Now a days because of more demand for safety in vehicles irrespective of the cost much of research is going on Vehicular Ad hoc Networks (VANETs). Basically VANETs are distributed self organizing, self-healing communication network formed by vehicles. It involves communication among vehicles, vehicles and Road Side Units (RSU) and sometimes among Wireless Access in Vehicular Environment (WAVE) devices.

With respect to Media Access Control (MAC), several VANET issues arises which includes information management, routing, network management, congestion and collision control, maximum message dissemination, privacy and security [1]. Nowadays because of increasing in the demand for safety in vehicles irrespective of the cost much of research is going on VANET. To do communication between vehicles, routing takes an important role which can be defined as selection of best path for a message to reach its destination. An agent is software which functions under self governance in a particular environment. The Belief-Desire-Intention (BDI) model is considered as the execution of an agent's belief, desire, and intention to find a solution for a particular issue in agent programming.

Many research works have been proposed for VANET routing mechanisms. Few ongoing related research works are given as follows. In [2], an outline of the VANET technology, VANET standards and issues, with some suggestions for the most necessary applications is proposed along with the future research. Different existing routing protocols with their merits and demerits for Vehicle-to-Vehicle (V2V) and Vehicle-to-Infrastructure (V2I) communication is proposed in [3]. Application of cellular networks to present a novel communication for vehicles is presented in [4]. It combines both V2V and V2I into one system to propagate the message among vehicles (V2V) and between the car and the road side infrastructure (V2I).

In [5], design and evaluation of DSR (Dynamic Source Routing) through simulation for different communication environments is presented. A fast path recovery scheme for V2V communication using AODV (Ad-hoc On Demand Distance Vector) protocol is proposed in [6], where basic AODV is modified whenever there is a link failure occurs. At the time of link failure, this protocol is used to find the direction of destination vehicle and broadcasts it to its neighbors to find the new path.

A dynamic Routing-Tree based Data Forwarding (RTDF) algorithm that focuses with a static hotspot on road networks is presented in paper [7]. When vehicle receives more number of inquiries at a time the hotspot will transmit messages to build a path-tree for the delivery of data. In [8] an efficient multi hop reliable broadcast routing algorithm for VANETs based on mobility prediction and relative velocity is presented. Because of high mobility there is frequent changes in network topology of VANET. Hence in [9] a Reliability model is applied to the Ad-hoc On Demand Distance Vector (AODV-R) is proposed. This scheme is based on link between vehicles which is calculated by means of the position, direction and speed of vehicles along the path.

A survey of vehicular communication systems, with all technical details to develop projects in industry and academia is given in [10]. In [11] a trusted geographic information routing protocol (TGPSR) is proposed which provides protection against malicious nodes. The work given in [12] explains current research issues on information management techniques considering four network architectures of VANET as V2V, V2I, Vehicle-to-Pedestrian (V2P) and hybrid employed for applications related to safety in VANETs, which covers gathering, validation, aggregation and dissemination. To establish the communication between vehicles using fish swarm algorithm for hybrid communication is proposed in [13].

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A framework for keen learning and choice making techniques to build smart, intelligent and centralized traffic management model is proposed and discussed in [20], further paper shows a cognitive radio enabled VANET for multi-agent based ITS. The scheme demonstrates two model for data trade, one is dynamic (V2V) and another is semi-dynamic (V2RSU).

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Intelligent Routing for Hybrid Communication in VANETs

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Abstract— **Vehicular Ad hoc Network (VANET) is an emerging technology with some unique characteristics that makes it different from other ad-hoc networks. VANETs could be a key networking technology of the future vehicle communications, where the communication is possible between V2V, V2I and other hybrid architectures. One of the major issues in VANET is routing due to high mobility and dynamic topology. Since the routing protocol decides how better the communication occurs between the vehicles, the design of routing protocol is very important. We bring the current research efforts on the intelligent routing scheme for VANET. In this research paper, we determine the position of vehicles using GPS, in both city and highway scenarios and establish the communication links between vehicles based on fish swarm algorithm. Our simulation results shows that the proposed intelligent routing algorithm performs better in terms of bandwidth utilized, packet delivery ratio and end-to-end delay etc.**

Index Terms-**Vehicular Ad hoc Network, Intelligent Routing, Fish Swarm Optimization and Hybrid Communication**

I. INTRODUCTION

The main task of the VANET is to receive and transmit information from all the neighboring vehicles in case of emergency situation such as heavy traffic jams, accidents and during climatic disasters. The main aim of our work is to design an intelligent routing scheme between two vehicles. This work is based on the scenario, where vehicles move at a different velocity along two different or same directions on the same or two different lanes road. Simulation experiments are performed to evaluate the performance of our proposed scheme in comparison with the other existing routing protocols in VANETs.

In paper [1], author has discussed the main characteristics and the research challenge of routing in VANETs, which may be considered in designing various routing protocols, they surveyed and compared symbolized instances for all the classes of protocols.

The paper [2] provides an overview on current research state, challenges, and potentials of VANETs as well as the ways forward to achieving the long awaited Intelligent Transportation System (ITS).

In VANETs, to have smart ITS, survey of different routing algorithms in different scenario is an essential and important issue. From the survey done it was seen that the existing routing protocols are not effective to meet all traffic scenarios. Thus the authors in [3] presented the design of an efficient routing protocol. The advantages and disadvantages of present routing protocols are also given in this paper which can be considered for further advancement of any new routing protocol.

Authors proposed a new vehicular reliability model to find the reliable route in VANETs. The reliable path is calculated using the location, direction and velocity information of vehicles along the road in [4].

Paper [5], presents an enhanced version of the well-known Dynamic Source Routing (DSR) scheme based on the Ant Colony Optimization (ACO) algorithm, which can produce a high data packet delivery ratio in low end to end delay with low routing overhead and low energy consumption.

A novel routing scheme, Anchor-Geography based routing protocol (AGP), designed specifically for VANET communication in city environment is proposed in [6], reactive broadcasting is used for both getting destination location and routing discovery and they show that AGP protocol gains improvement in packet delivery ratio and average hops.

For VANET routing a Hybrid Bee swarm Routing (HyBR) algorithm is presented in [7]. HyBR considers the rapid changes in environment which is the key feature of VANETs in real time for continuous learning paradigm. The features of geographic routing and topology routing are combined in this algorithm. HyBR considers both urban and rural road scenario

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Frequency Compression of Speech for Improving Speech Perception in Sensorineural Hearing Loss: FBS Approach

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***Abstract*—Filter-bank summation (FBS) method is a commonly used technique for multi-band processing of speech and audio signals, especially in digital hearing aids. In multi-band speech processing techniques, filter bank summation provides the convenient way of processing the auditory information present in different bands based on their perceptual significance. People with hearing loss have issue in perception of speech due to widening of the auditory filter bandwidth leading to increased frequency masking. Previous studies have shown that spectral splitting of speech signal for binaural dichotic presentation helps to reduce the effect of frequency masking. Also studies showed that using multiband frequency compression it is possible to compensate the effect of widened auditory filters. This paper presents a filter bank summation method to perform dichotic spectral splitting of input speech signal followed by frequency compression to enhance speech perception for hearing impaired. In the present study, the speech signal is split into eighteen frequency bands ranging from 0–5000 Hz based on auditory critical bandwidths and frequency samples of every band compressed in the direction of center of each band using spectral segment frequency mapping technique. Performance of the algorithm was evaluated using MOS test for subjective assessment of speech quality and Perceptual Evaluation of Speech Quality (PESQ) scores for objective assessment of speech quality. The results showed a significant improvement in speech quality as indicated by MOS and PESQ scores for the SNR values in the range of −6 dB to 6 dB.**

***Index Terms*—Sensorineural Hearing Loss (SNHL); Spectral Masking; Filter Bank Summation Method; Dichotic spectral splitting; Frequency Compression.**

I. Introduction

Sensorineural hearing loss (SNHL) occurs when the functioning of the cochlea is affected or when there is dysfunction of the auditory nerve or higher centres in the auditory pathway. The bandwidth of auditory filter normally widened and selection of frequency gets reduced due to masking of spectral components [1], [2]. So SNHL persons have problem in understanding the speech due to broader auditory filters, leading to smoother representation of speech spectrum [3]. This causes poor perception of speech by hearing impaired people.

Hearing loss commonly occurs at higher frequencies. Hearing aid technology provides frequency-dependent amplification for hearing-impaired (HI) persons. Existing hearing devices have a constrained capacity to give adequate gain for high-frequency sounds [4]. This confines the perceptibility of significant sounds, particularly for persons with critical hearing impairment. High frequency components of the speech signal gives essential linguistic information (especially for fricatives) to the listeners.

In frequency transposition [5] method and slow playback high-frequency speech samples shifts to the regions of low frequency by a constant factor These traditional methods of transposition of frequency [6–9] were helpful in recognition of speech, but results in degradation of sound quality. The investigation of the effectiveness of multi-band frequency compression methods using different compression values, to enhance the speech audibility is discussed in [10]. In this method, the spectrum of speech is split into various frequency bands and frequency samples in every band are compressed in the direction of center of band by fixed compression rates. The technique helps in improving the speech quality for hearing impaired people. The work given in [11] reduces the effect of spectral masking using filter bank summation method. A signal is split into 15 frequency sub bands using an analysis filter banks. These 15 frequency bands were designed with sampling frequency of 12 kHz, pass band ripple and stop band attenuation less than 1 dB and 40 dB. These sub band signals were combined by using synthesis filter bank which accomplishes the frequency compression. The problem of masking of spectral components, for listeners with bilateral SNHL, can be reduced with binaural dichotic spectral splitting, using auditory critical bandwidth (ACB) based comb filters [12]. Speech perception can be improved by using a pair of complementary comb filters by adjusting interband crossover gain (between 4 and 6 dB) below pass band gain.

The paper [13] discussed the effect of linear frequency transposition (LFT) and nonlinear frequency compression (NFC) in improving the speech perception for school aged children. Paediatric participants with varying audiometric characteristics such as total distortion of the auditory system, amount of hearing loss, and the usage of hearing aid were considered for evaluating the efficiency of NFC and LFT. The analysis of both the methods was conducted for each subject based on above mentioned levels. The consequences of this examination proposes that LFT and NFC can enhance the perceptibility of high frequency (consonant) sounds and improve understanding

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Routing in Opportunistic Networks: Taxonomy, Survey

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***Abstract*— The accelerated growth of wireless communication such as personal digital assistants, tablets, smart phones, that are carried by the people may arrange themselves in to a special network for the communication of messages. The moving nodes communicate with the nearby nodes using node contact opportunity through Wi-Fi or blue tooth. These nodes suffer from frequent disconnections. The network with frequent disconnections is known as opportunistic network or intermittently connected network. It is a unique wireless network architecture which enables the mobile nodes to have communication with each other in environment where there is no continuous route exists between source and destination .Such networks espouse store-carry-forward habit for the message transfer and utilize mobility of moving nodes for message communication. These networks are featured with network topology which is unstable and also long latency. Routing requires the nearby neighborhood nodes information for the message transfer. Depending on the routing action, we categorize routing schemes as social aware information schemes and social zero information schemes. The schemes such as social zero information do not require any past information of the nodes behavior. Subject to the content of information, social aware schemes are furthermore categorized as microscopic and macroscopic schemes. Microscopic schemes utilize mobile user's movement. Whereas macroscopic schemes have integrated social relationship with the mobile user's movement. We explicate about the routing solutions for the microscopic and macroscopic schemes. Additionally we briefly discussed evaluations in routing schemes.**

Keywords*— *Opportunistic Networks, Intermittently connected network, Store-carry-forward.

I. INTRODUCTION

In the present networking world, wireless communication plays a predominant role. The accelerated growth of mobile devices like laptops, smart phones, notebooks etc makeup mobile communication area a more fascinating research in recent years. Another extension of the mobile has inclined to the Mobile Ad-hoc Network (MANET) model known as Opportunistic Networks (ONs). These networks make use of nodes mobility characteristic, to enter the communication range of each other. This helps to establish communication path between the nodes to transfer the information. ONs suffer from unstable network topology as well as prolonged latency because of frequent disconnections [1]. Such networks suffer from abruptly intermittent connections because of moving nodes. These networks are also entitled by intermittently connected networks. Nodes suffer from the initial knowledge of the structure of the network because of random movement of the nodes. So the routes are created dynamically and relay nodes or intermediate nodes take active part in the transferring of messages to respective destinations. If the intermediate nodes cannot find any forwarding opportunity within its communication range then, the nodes store the messages and carry the messages until they find next upcoming contacts to forward the messages [2]. Using Wi-Fi, Bluetooth, the built in technologies, nodes communicate with each other. The network is accustomed by mobile devices which are carried by human beings and hence routing is a challenging task. The major concern in ONs is reliable transfer of message to the destination. Hence co-operation between the nodes and storage of messages are the primary requirement [3].

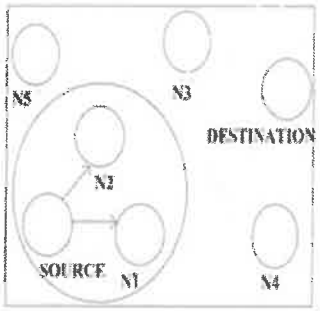

Fig.1 (a)

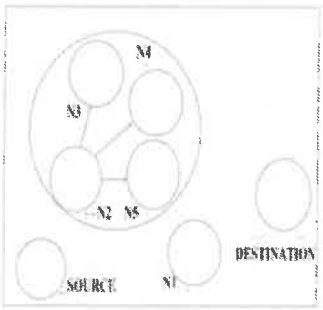

Fig. 1 (b)

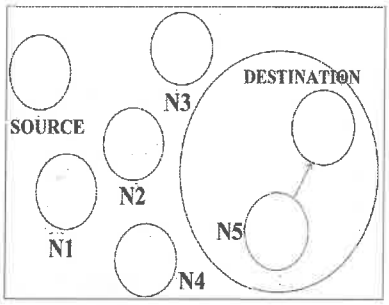

Fig.1 (c)

Fig.1 Message forwarding in opportunistic networks

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Review of Microscopic and Macroscopic Routing Algorithms in Opportunistic Networks

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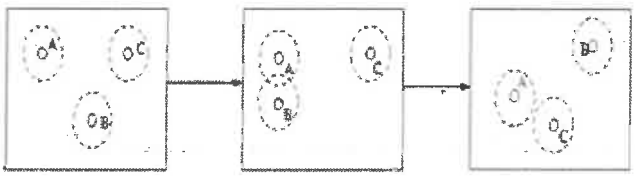
Abstract— **Opportunistic networks are highlighted with long latency and unstable network topology. It is a unique wireless network architecture which enables the mobile nodes to have communication with each other in environment where there is no continuous route between source and destination. In this network scenario there is no continuous routing path exist between source and destination. Using intermediate nodes information is conveyed to the destination. These networks espouse capture - move-forward behavior arising from the mobility of the mobile nodes for message relying. In this article we explicate about the challenges of the opportunistic networks, classification of routing protocols, also confer about the metrics required for the performance measurement of routing algorithms. For the message transfer, routing requires information about the neighborhood nodes. Based on routing behavior, we classify routing protocols as social zero information schemes and social aware information schemes. Social aware information schemes are further classified into microscopic schemes and macroscopic schemes depending upon content of the information. In this paper we discuss some of recent microscopic and macroscopic routing protocols and also confer the comparison among the reviewed algorithms.**

Keywords—Opportunistic Networks, Routing,Mobility pattern

I. INTRODUCTION

In our daily life, wireless communication plays an important role. Recent progress in wireless technologies such as 3G, 4G, and Bluetooth, Wi-Fi, another advancement of the Mobile has given rise to Ad-hoc Network (MANET) model called Opportunistic Networks (ONs). ONs are challenged MANETs and are characterized by opportunistic connectivity i.e. data is forwarded opportunistically whenever contact between the nodes take place. ONs are one of the types of Delay Tolerant Networks (DTNs) that are highlighted with long latency and unstable network topology. Due to the node mobility, these networks may have unexpectedly intermittent connections. So these networks are also called by intermittently connected networks.

ONs are one of the interesting advancements of MANETs where the nodes do not have any prior knowledge about the structure of the network. In such scenario routes are built dynamically and the communication between mobile nodes are enabled via the intermediate nodes called as relay nodes. When no forwarding opportunity exists within its transmission range intermediate node captures the message and waits for the upcoming contacts to forward the information. ONs are also called as Packet Switched Networks (PSN) i.e. networks formed by people carrying mobile devices [1]. Fig. 1 illustrates an example how routing in ONs take place to transfer the messages between disconnected nodes. We referred node B as source and node C as destination. In fig.1 (a) node B initially carries the message and fig. 1(b) node B relays the message to node A since it is in node's B proximity. Then message is delivered to destination node C when node A encounters node C in fig.1(c).



(a) Initially B carries message (b)B relays message to A (c) Finally message is delivered to C

Fig. 1 Routing in opportunistic network

One of the important and compelling challenges in opportunistic networks is to find routes from source-destination, because of the lack of direct connectivity between the node pairs for transferring of message. The routing protocols in ONs are classified into infrastructure-less protocols and infrastructure based protocols [2]. The routing protocols should provide maximum delivery ratio, minimum overhead ratio, minimum cost, minimum delivery delay, maximum route quality, maximum node popularity etc. In this paper we review the recent progress in opportunistic networks routing/forwarding protocols. The organization of the paper is as follows. The challenges of Routing in opportunistic networks are described in Section 2. Section 3 reviews the related work. In section 4 we compared the performance parameters of reviewed protocols and section 5 describes few applications of opportunistic networks. Conclusion is depicted in section 6.

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Implementation of FPGA Based Closed Loop V/f Speed Control of Induction Motor Employed for Industrial Applications

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Abstract— **In recent days, Field Programmable Gate Array (FPGA), provides the ability to integrate multiple tasks through the parallel operations. This processor is preferred over DSP for the implementation of controller to control speed of induction motor through power converter employed in industrial applications. This paper presents the implementation of FPGA based closed loop V/F speed control of induction motor. The existing approaches having the limitations of regulating slip and conversion of frequency in proportion to the slip. This issue can be addressed by summing the slip with actual speed during conversion of speed into frequency. Further, this paper focuses on the development of the PI controller using Xilinx block sets to improve the tracking ability of the controller. The developed controller is validated on hardware test bench consisting of FPGA based controller connected to Induction motor drive. Finally, it can be concluded that FPGA processor provides a real deterministic behavior of induction motor employed in industrial applications**

Keywords- FPGA, Induction Motor, v/f speed control, wavect, Xilinx

I. INTRODUCTION

Energy is the indispensable factor in the development and economic growth of industry and country. The majority of energy consumption in industries is dominated by drive systems such as pumps, fans and compressors. These systems are continuously operated to improve the productivity and quality of products in various industrial applications Viz Process control, automotive control, Robotic and electric vehicle operation[1]. There is a need of efficient controller for variable or adjustable speed drive to optimize the power fed to these systems, which leads to energy conservation and reduction in overall cost of the system. The Induction Motor (IM) accounts 85% of all motors and has dominated over a number of fixed- speed applications because of its reliability and low maintenance operation compared to DC motors.

The V/F controlling strategy is most popular method as the ratio of voltage to frequency is kept constant, thereof flux remains constant. Torque speed characteristic of V/F control implies that starting current is low, the stable operating region of motor is increased and speed range of motor becomes wider [1]. The V/F control strategies are implemented effectively using power converters [2-7].

The various processors like Micro-controllers and DSPs are commonly used to control the speed of induction motors [2,12,14].Considerable research has been done in using DSP processors for digital implementation of V/F control. This method involves various computations like fractional multipliers, high-resolution integer, math with fractional numbers. To obtain this task an additional DSP processor is used, but this complicates the design considerably and also increases the size of the system [14]. In view of this, there is need of shifting to more advanced technologies like FPGA processors.

FPGA processor offers more flexibility in designing of PWM generator for power converters connected to Induction motor [9-11]. FPGA basically having interconnection between logic gates, which combined to form a combinational logic blocks. Customized architecture reduces the execution time of control algorithm. The processor offers direct hardware implementation while maintaining the high control performance systems.

This paper presents the design and implementation of FPGA modified closed loop V/F control of induction motor. The modified approach addresses the issue of limiting the slip value for the conversion of new frequency value at the inverter. Further the contribution of this paper is to implement PI controller using Xilinx block sets. The purpose of this controller is to improve the tracking ability and instantaneous response of the controller during the change in mechanical load on the induction motor. The entire Xilinx model is validated on hardware test bench consisting of FPGA based controller connected to Induction motor drive. Finally, it is observed from the hardware results that, FPGA processor provides a real deterministic behavior of induction motor employed for industrial applications.

II. CLOSED LOOP V/F SPEED CONTROL

The generalized block diagram of V/F closed loop control of Induction motor drive is shown in Fig.1. The actual speed is compared with reference speed in rad/sec, this frequency is

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Critical Review of Control Strategies for Switched Reluctance Motor Employed in Electric Vehicle

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Abstract- **This paper presents a critical review of control strategies for switched reluctance motor employed in electric vehicle. The survey is carried out on various control strategies namely average torque control, instantaneous torque, torque sharing and direct instantaneous torque control. The purpose of the survey is to identify the capability of control strategies in terms of speed and torque of SRM for electric vehicle application. The preliminary observation from the study is that, SRM have high torque ripples and it is severe during commutation between the adjacent phases. Further, it also leads to high acoustic noise, vibration and harshness of the electric vehicle system. In view of this, there is need to develop an appropriate control method to overcome the said problems of SRM drive employed in EVs.**

Keywords: Switched Reluctance Motor, Electric Vehicle, Average Torque Control, Instantaneous Torque Control, DITC.

I. INTRODUCTION

The first electric vehicle (EV) was built in 1834 and these were preferred for road transportation among the wealthy privileged. However, usage of EV was limited due to superior performance of internal combustion engine vehicles (ICEVs). Further, EVs have gained importance during the year 1970s due to energy crises and inefficient oil storage facilities. Traditionally, Electric Drive System (EDS) converts the electrical energy in to mechanical energy which is performed by the electric motors. Selection of electric motor is the critical part in designing overall EV system.

In recent past several motors were employed in EVs Viz. DC motor, induction, permanent magnet synchronous motors and brushless DC motors. The DC motors have simple control, decoupling of flux and torque but their construction poses maintenance problems [1-2]. Even though squirrel cage induction motor is reliable in terms of its speed regulation under different loading conditions, but it has drawback of poor starting torque due to low rotor resistance and low efficiency at high speed [1-2]. Permanent magnet synchronous (PMS) motors are good for traction application but require a complicated controller to control field flux, magnetic characteristics and speed of the motor [1-3]. Brushless DC motor has high initial cost due to its construction and it requires complicated controllers to determine the rotor position [1].

Recently switched reluctance motor (SRM) are gaining much interest for the operation of electric vehicle due to its simple and rugged construction, ability of extremely high-speed operation and hazard-free operation [4]. These features of SRM make it possess strong competition in EV applications. Major shortcoming of SR motor is high torque ripple as compared to conventional AC machines. These torque ripples are due to the discrete excitation of phase windings and torque is not constant in the period of commutation between two adjacent phases. In general, there are two approaches to reduce torque ripple, first approach is to modify the hardware design of the motor and second approach is to design various control strategies to control speed and torque [4].

Hardware design does not guarantee the performance of SRM as it involves time-varying complex non linear speed control system. Design of control strategies to minimize the torque ripple for SRM drive is presented [7-27]. The design of control strategy is mainly based on various parameters like supply voltage, position sensors, turn-on and turn-of angle and current. The optimal control strategy has to be developed for best motoring operation of the EVs. The best motoring operation is considered as high motoring torque, high operating efficiency and low torque ripple [5].Few literatures presents a method that determines the optimal turn-on and turn-off angles to accomplish an acceptable balance between energy efficiency and torque ripple criteria [7-14]. Instantaneous torque control methods are proposed for fast time response and low torque ripple [15-18]. Four types of torque sharing functions are implemented to minimize the torque ripple in SRM drives [19-22]. Several studies presented DITC in which torque is used as the direct control variable in order to achieve fast torque dynamics [24-27].

In view of issues related with EVs, there is need for detailed analysis of control methods to control the speed of SRM drive employed in EVs. An effort is made to study the performance of various control strategies for SRM drive in terms of higher efficiency and low torque ripple. Observation from the survey will help the designers to develop an appropriate control method to overcome the said problems of SRM drive based EVs.

II. REVIEW OF CONTROL STRATEGIES

Traditionally, the control strategies are proposed in order to improve the performance of SRM drive for EVs in terms of higher efficiency, constant torque, low torque ripple and ability to operate in wide speed range. In view of this, broad classification of control strategies are presented in this paper Viz Average torque control, Instantaneous torque control, Torque sharing function (TSF) and Direct instantaneous torque control (DITC). A critical analysis of the above said control strategies are discussed in the following sections.

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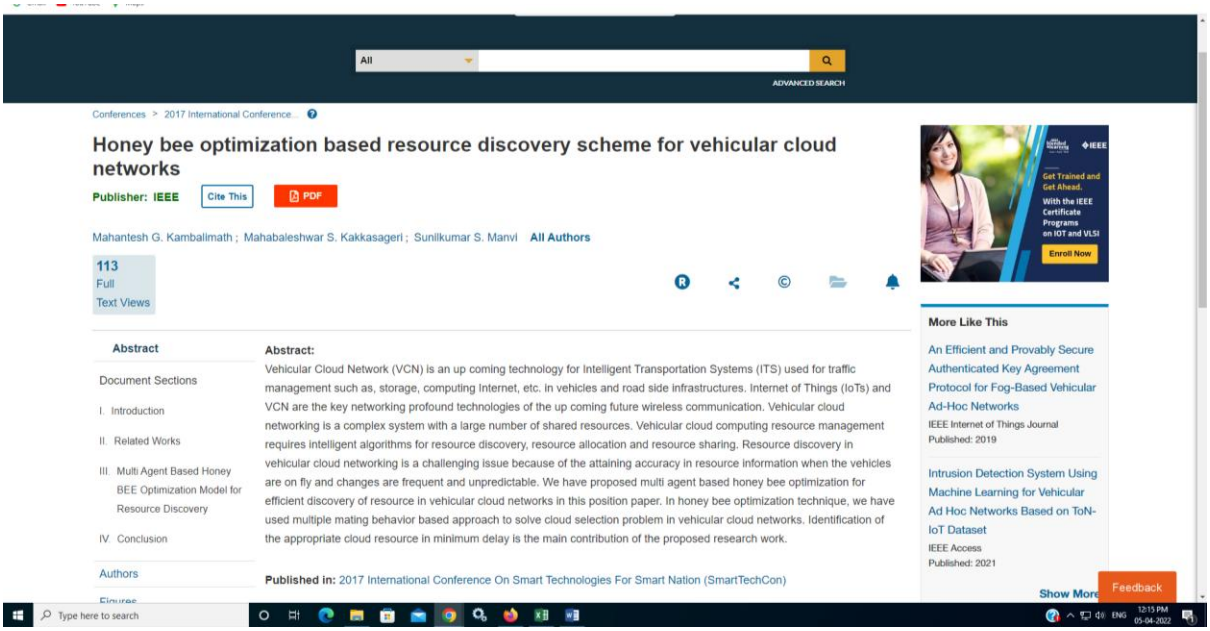
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Honey bee optimization based resource discovery scheme for vehicular cloud networks
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III. Multi Agent Based Honey BEE Optimization Model for Resource Discovery
IV. Conclusion
Authors
Abstract:
Vehicular Cloud Network (VCN) is an up coming technology for Intelligent Transportation Systems (ITS) used for traffic management such as, storage, computing Internet, etc. in vehicles and road side infrastructures. Internet of Things (IoTs) and VCN are the key networking profound technologies of the up coming future wireless communication. Vehicular cloud networking is a complex system with a large number of shared resources. Vehicular cloud computing resource management requires intelligent algorithms for resource discovery, resource allocation and resource sharing. Resource discovery in vehicular cloud networking is a challenging issue because of the attaining accuracy in resource information when the vehicles are on fly and changes are frequent and unpredictable. We have proposed multi agent based honey bee optimization for efficient discovery of resource in vehicular cloud networks in this position paper. In honey bee optimization technique, we have used multiple mating behavior based approach to solve cloud selection problem in vehicular cloud networks. Identification of the appropriate cloud resource in minimum delay is the main contribution of the proposed research work.
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Influence of heat treatment on the volumetric wear rate of Al-25Mg_2Si2Cu4Mn alloy

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Abstract

Strength of a material is very important factor in selecting the material or alloy for various applications, with this it should also possess good mechanical as well as tribological properties. In this paper, the influence of the heat treatment, load and sliding velocity on the volumetric wear rate of Al-25Mg_2Si2Cu4Mn alloy was evaluated using a pin-on-disc wear testing machine. Dry sliding wear test were conducted for four different loads (1, 2, 3 and 4kg), for four different velocities (1, 2, 3 and 4m/s). It was observed that the volumetric wear rate decreased with increasing load at constant speed and at constant load with increasing speed the volumetric wear rate increased.

Selection and Peer-review under responsibility of [Conference Committee Members of International Conference on Advanced Materials, Manufacturing, Management and Thermal Sciences-2016]

Keywords: Heat treatment, sliding velocity, volumetric wear rate and Al25Mg_2Si2Cu4Mn alloy.

1. Introduction

Potential applications in areas such as automotive, aerospace and sporting goods industries require light weight and strength combination along with good wear and corrosion resistance [1]. Fatigue strength and good impact strength are available due to the addition of alloying elements in the Al-Si alloys [2]. Alloys have a high resistance to corrosion and others possessing significant strength at elevated temperature is invaluable for chemical plants and for the boilers which are working at high temperature and pressure [3].

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A comparative study of the tribological properties of as cast and 3Hr T6 treated Al-25Mg_2Si2Cu4Fe alloy

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Abstract

Research work has been carried out to ascertain the effects of T6 heat treatment on the Al25Mg_2Si2Cu4Fe alloy and compare the results with their as cast counterpart. It is observed that the precipitation of the intermetallics and their growth with increase in the homogenizing hours leads to improvement in the wear resistance. Blocks of Mg_2Si intermetallics are found distributed unevenly in the aluminium matrix along with sharp and coarse needles of Fe in the matrix in as cast structure. In T6 treated structure, Chinese script structure of Al_2Cu precipitates are also distributed randomly in the aluminium matrix. SEM structure shows rounded corners of Mg_2Si blocks embedded with Fe in it. Due to the interaction with the Fe needles Mg_2Si blocks get fragmented into smaller sized pieces with rounded corners. Fe needles get reduced in diameter increasing their aspect ratio. Thus Fe gets distributed in the matrix get strengthens the matrix. Therefore, volumetric wear rate at constant sliding speed increases only slightly and remains clustered for all the sliding speeds with increasing load.

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Keywords: Volumetric wear rate, Sliding speed, Load.

1. Introduction

Highly alloyed 6xxx series alloys have complex intermetallic phases that originate from the casting stage in the form of ingot. Since iron is the omnipresent impurity having very low solubility in aluminium, iron rich phases are seen in aluminium alloys that adversely affect the ductility and castability. Presence of copper, manganese leads to the formation of $(Fe,Mn,Cu)_3SiAl_{12}$ phase. Mg_2Si is the other phase that easily dissolves during solutionizing and contribute to the precipitation hardening process. The type of intermetallic compounds formed depends on the

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Wear behavioural studies on 3Hr homogenized Al-25Mg_2Si2Cu4Ni alloy at constant speed

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Abstract

In the present work, a study on the wear behaviour of as cast aluminium (Al-25Mg_2Si2Cu4Ni) alloy which has been homogenized for 3hr with T6 heat treatment is studied. Various parameters like friction force, friction co-efficient, speed and volumetric wear rate and their relationship has been studied. It is observed that the fiction force and the volumetric wear rate are high at lower loads and reduce accordingly with an increase in load. Whereas, the interface temperature is lower at the low loads and increases accordingly with the increase in loads. Results of SEM structure show rounded corners of Mg_2Si intermetallic blocks embedded with Ni in it due to the effect of 3hour homogenizing.

Selection and Peer-review under responsibility of Advanced Materials, Manufacturing, Management and Thermal Science (AMMMT 2016).

Keywords: Volumetric wear rate, coefficient of friction, solutionizing, Interface temperature.

1. Introduction

Wide applications in the field of aerospace, automobile, infrastructure and marine industries for aluminium alloys is due to its light weight, high strength and corrosion resistance properties. Therefore, aluminium alloys contribute in reducing fuel consumption, cost and achieving better design compared to steels. Major components manufactured with Al-Si alloys have applications in the process that requires smooth operation below and at 250^{0}C. Due to incoherency in the lattice structure, between the aluminium solid solution lattice and the precipitates such an alloy is not suited for high temperatures applications. Due to the presence of silicon (more than 12%) low wear rate, lower thermal coefficient of expansion lower thermal coefficient of expansion have been observed. Fluidity and machinability are excellent that gives good chip removal rate.

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Stress and damage tolerance analysis of stiffened panel with passenger door cutout in airframe structure using FEA

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Abstract

It is very essential to design the airframe structure with minimum possible weight without compromising on the structural safety. Fuselage has many stress concentration areas. Passenger door cutout region is one among such critical regions. Current work includes stress and damage tolerance analysis of a critical region in the fuselage structure. The structure considered for the analysis includes a stiffened panel with a passenger door cutout and surrounding area with the presence of stiffening members. The present work also includes the damage tolerance analysis of the panel in presence of a crack emanating from the high stress location. The pressurization load case is one of the critical load cases considered for the design of the aircraft structure. The tensile loads at the edge of the panel corresponding to pressurization will be considered for the linear static analysis of the panel. A location of maximum tensile stress and its magnitude will be identified from the stress analysis. Stress intensity factor calculation is carried out for different incremental crack lengths for a crack emanating from the high stress location. Modified virtual crack closure integral method is used for stress intensity factor calculation.

Selection and Peer-review under responsibility of Advanced Materials, Manufacturing, Management and Thermal Science (AMMMT 2016).

Keywords: Fuselage; damage tolerance; pressurization; stress intensity factor; MVCCI.

1. Introduction

Safety and weight are two major considerations in aircraft design. There should not be any compromise between safety and weight. During its life cycle it will be subjected to many load cases such as drag force, lift force, thrust force, pressurization load etc. The load-bearing members of these main sections, those subjected to major forces are called the airframe [1] and [12].

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Optimization of Machinability Parameters of Al1100-B_4C Composites using Taguchi Method

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Abstract

Recently, Aluminum and its alloys have been receiving major attention as matrix materials because of their excellent properties such as light density, good strength, stiffness, wear resistance and improved thermal, electrical properties, and importantly high strength to weight ratio. The mechanical characterization and optimization of machining parameters of any materials are the crucial things in many engineering applications. In this context, the study is made on the behavior of cutting parameters of Aluminum based composite materials (Al-B_4C). The present investigation concentrates on optimization of the cutting parameters for improving machinability of Aluminum Alloy (AA1100) Boron Carbide (B_4C) composites by considering surface roughness and cutting forces as response variables. Taguchi's method is employed to determine optimum process parameters for dry turning of AA1100-B_4C. L9 orthogonal array is employed for the experimental design. Finally Analysis of Variance (ANOVA) is performed to know the impact of individual factors on surface roughness and cutting forces. Results obtained by Taguchi method and ANOVA closely match. It is observed that reinforcement percentage by weight and cutting speed are most influencing parameters. Multiple regression equations are formulated for estimating predicted values of surface roughness and cutting forces.

Selection and Peer-review under responsibility of Advanced Materials, Manufacturing, Management and Thermal Science (AMMMT 2016).

Keywords: Machinability, surface roughness, cutting forces, Taguchi's method, ANOVA, Multiple regression.

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Dr. Dayanand G. Mallapur

Optimization of control factors in tribological studies for as cast and 1Hr T6 treated Al25Mg2Si2Cu4Fe alloy using Taguchi methods

Authors DG Sondur, DG Mallapur, K Rajendra Udupa

Publication date 2018/1/1

Journal Materials Today: Proceedings

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Description In this study, using the predictive model offered by Taguchi, optimization of wear parameters was carried out. Controlling factors such as sliding speed, load and T6 heat treatment (homogenizing hours) were considered. Pin on disc type friction monitor was used for determing the volumetric wear rate under constant speed for as cast and 1Hr T6 treated conditions. The L_{16} orthogonal array, signal to noise ratio (S/N) and regression results were used to arrive at optimal control factor values that affect the volumetric wear rate of the alloy. Combination of the dominating control factors has been predicted using Taguchi technique. Predicted combination of control factors were found to be close to the experimental observations i.e load was found to be a dominant factor for volumetric wear rate. Also 1Hr T6 treated alloy shows a higher volumetric wear resistance as compared to as cast alloy.

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Experimental optimization of volumetric wear behavioural study of as cast and 1hr homogenized Al-25Mg2Si2Cu4Ni alloy at constant speed based on Taguchi method

Authors MD Harlapur, DG Mallapur, K Rajendra Udupa

Publication date 2018/1/1

Journal Materials Today: Proceedings

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Publisher Elsevier

Description In the current study, an experimental optimization study on the volumetric wear behaviour of Aluminium (Al-25Mg_2Si2Cu4Ni) alloy in as cast and 1Hr homogenized with T6 heat treatment is carried out at constant speed. The Pin-on-disc apparatus was used to carry out sliding wear test. Taguchi method based on L-16 orthogonal array was employed to analyze the data on the wear behaviour. Signal-to-noise ratio with the objective of smaller the better and mean of means results were used. General regression model is obtained by correlation. Lastly confirmation test was completed to make a comparison between the experimental results foreseen from the mentioned correlation. The mathematical model reveals the load has maximum contribution on the wear rate compared to speed. Scanning Electron Microscope was used to analyze the worn-out wear surfaces. Wear results show that 1Hr homogenized Al-25Mg_2 ...

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Dr. Dayanand G. Mallapur

Wear behavioral study of as cast and 7 hr homogenized Al25Mg_2Si2Cu4Ni alloy at constant load

Authors MD Harlapur, DG Sondur, VG Akkimardi, DG Mallapur

Publication date 2018/4/20

Journal AIP Conference Proceedings

Volume 1943

Issue 1

Pages 020076

Publisher AIP Publishing LLC

Description In the current study, the wear behavior of as cast and 7 hr homogenized Al25Mg2Si2Cu4Ni alloy has been investigated. Microstructure, SEM and EDS results confirm the presence of different intermetallic and their effects on wear properties of Al25Mg2Si2Cu4Ni alloy in as cast as well as aged condition. Alloying main elements like Si, Cu, Mg and Ni partly dissolve in the primary α-Al matrix and to some amount present in the form of intermetallic phases. SEM structure of as cast alloy shows blocks of Mg_2Si which is at random distributed in the aluminium matrix. Precipitates of Al2Cu in the form of Chinese script are also observed. Also 'Q' phase (Al-Si-Cu-Mg) be distributed uniformly into the aluminium matrix. Few coarsened platelets of Ni are seen. In case of 7 hr homogenized samples blocks of Mg2Si get rounded at the corners, Platelets of Ni get fragmented and distributed uniformly in the aluminium matrix. Results ...

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Dr. Dayanand G. Mallapur

Experimental analysis of volumetric wear behavioural and mechanical properties study of as cast and 1Hr homogenized Al-25Mg_2Si2Cu4Ni alloy at constant load

Authors: MD Harlapur, DG Mallapur, K Rajendra Udupa

Publication date: 2018/4/20

Journal: AIP Conference Proceedings

Volume: 1943

Issue: 1

Pages: 020027

Publisher: AIP Publishing LLC

Description: In the current study, an experimental analysis of volumetric wear behaviour and mechanical properties of aluminium (Al-25Mg2Si2Cu4Ni) alloy in as cast and 1Hr homogenized with T6 heat treatment is carried out at constant load. Pin-on-disc apparatus was used to carry out sliding wear test. Mechanical properties such as tensile, hardness and compression test on as-cast and 1 hr homogenized samples are measured. Universal testing machine was used to conduct the tensile and compressive test at room temperature. Brinell hardness tester was used to conduct the hardness test. The scanning electron microscope was used to analyze the worn-out wear surfaces. Wear results and mechanical properties shows that 1Hr homogenized Al-25Mg2Si2Cu4Ni alloy samples with T6 treated had better volumetric wear resistance, hardness, tensile and compressive strength as compared to as cast samples.

Scholar articles: Experimental analysis of volumetric wear behavioural and mechanical properties study of as cast and 1Hr homogenized Al-25Mg2Si2Cu4Ni alloy at constant load
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Dr. Dayanand G. Mallapur

Experimental wear behavioral studies of as-cast and 5 hr homogenized Al25Mg_2Si2Cu4Ni alloy at constant load based on taguchi method

Authors: MD Harlapur, DG Mallapur, K Rajendra Udupa

Publication date: 2018/4/20

Journal: AIP Conference Proceedings

Volume: 1943

Issue: 1

Pages: 020074

Publisher: AIP Publishing LLC

Description: In the present study, an experimental study of the volumetric wear behaviour of Aluminium (Al-25Mg2Si2Cu4Ni) alloy in as cast and 5Hr homogenized with T6 heat treatment is carried out at constant load. The Pin on disc apparatus was used to carry out the sliding wear test. Taguchi method based on L-16 orthogonal array was employed to evaluate the data on the wear behavior. Signal-to-noise ratio among the objective of smaller the better and mean of means results were used. General regression model is obtained by correlation. Lastly confirmation test was completed to compose a comparison between the experimental results foreseen from the mention correlation. The mathematical model reveals the load has maximum contribution on the wear rate compared to speed. Scanning Electron Microscope was used to analyze the worn-out wear surfaces. Wear results show that 5Hr homogenized Al ...

Scholar articles: Experimental wear behavioral studies of as-cast and 5 hr homogenized Al25Mg2Si2Cu4Ni alloy at constant load based on taguchi method
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Related articles All 5 versions

Dr. Dayanand G. Mallapur

Effect of T6 treatment on the coefficient of friction of Al25Mg_2Si2Cu4Fe alloy

Authors: DG Sondur, DG Mallapur, K Rajendra Udupa

Publication date: 2018/4/20

Journal: AIP Conference Proceedings

Volume: 1943

Issue: 1

Pages: 020080

Publisher: AIP Publishing LLC

Description: Effect of T6 treatment on the coefficient of friction of Al25Mg2Si2Cu4Fe alloy was evaluated by conducting wear test on pin on disc wear testing machine. Wear test parameters such as the load and the speed were varied by keeping one constant and varying the other respectively. It was observed that the coefficient of friction is high for as cast condition due to the brittle microstructure. After T6 heat treatment the precipitates formed such as the Chinese scripts and the Mg2Si blocks got modified that lead to improvement in the hardness and the wear resistance. This reduces the coefficient of friction.

Scholar articles: Effect of T6 treatment on the coefficient of friction of Al25Mg2Si2Cu4Fe alloy
DG Sondur, DG Mallapur, KR Udupa - AIP Conference Proceedings, 2018
Related articles All 5 versions

Dayanand G. Mallapur

Experimental studies on mechanical properties of T6 treated Al25Mg_2Si2Cu4Fe alloy

Authors: DG Sondur, DG Mallapur, K Rajendra Udupa

Publication date: 2018/4/20

Journal: AIP Conference Proceedings

Volume: 1943

Issue: 1

Pages: 020093

Publisher: AIP Publishing LLC

Description: Effect of T6 treatment on the mechanical properties of Al25Mg2Si2Cu4Fe alloy was evaluated by conducting mechanical tests on test pieces using universal testing machine. Increase in the mechanical properties such as ultimate tensile strength, hardness and % elongation was observed. Microstructure characterization revealed the modification in the size and shapes of the precipitates formed during the homogenization process. This modification increases the anisotropy of the microstructure and the stresses in the as cast structure. The increase in the hardness of T6 treated alloy is due to the partial recrystallization, fragmentation and redistribution of primary Mg2Si phase, precipitation of fine θ, Q phases. The high volume fractions of uniformly dispersed hard β-particles greatly increase the flow stress and provide an appreciable impediment to plastic deformation. Thus increasing the hardness of the alloy.

Scholar articles: Experimental studies on mechanical properties of T6 treated Al25Mg2Si2Cu4Fe alloy
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Dr. Dayanand G. Mallapur

Wear and mechanical property studies on ascast and 3H forged homogenized Al25Mg2Si2Cu4Ni alloy at constant speed

Authors MD Harlapur, DG Mallapur

Publication date 2018/1/1

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Description In present study, Al25Mg_2Si2Cu4Ni alloy is experimental used for investigating wear (friction coefficient) and mechanical properties in ascast and 3h homogenized forged conditions at constant speed. The sliding wear behavioral tests were carried out on a pin on disc apparatus for mechanical property studies universal testing machine was used. The hardness tests were carried out on Brinell hardness tester. To analyze worn out surfaces of as cast as well as forged samples, Scanning Electron Microscope was used. Wear and mechanical properties study of 3r homogenized forged Al25Mg_2Si2Cu4Ni alloy samples reveal better tensile strength, yield stress, compression strength and coefficient of friction as compared to the as cast ones, due to formation of secondary precipitate in the matrix

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Dr. Dayanand G. Mallapur

Wear behavioral studies of as cast and 7H forged homogenized Al25Mg2Si2Cu4Ni alloy at constant load based on Taguchi method

Authors MD Harlpur, DG Mallapur

Publication date 2018/1/1

Journal Materials Today: Proceedings

Volume 5

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Publisher Elsevier

Description In the current research work, an experimental study of wear behavior of aluminium (Al25Mg_2Si2Cu4Ni) alloy in as cast and 7hr homogenized forged at constant load is carried out. The sliding wear tests were carried out on a pin on disc apparatus. To evaluate the data on the friction force Taguchi method based on L-16 orthogonal array was employed. Objective of smaller the better and mean of means results are used for signal to noise ratio. For correlation general regression model was used. Confirmation test were carried out between the experimental results foreseen from the mention correlation. Load has maximum contribution on the friction force compared to speed as per the mathematical model. The worn out wear surfaces are analyzed using scanning electron microscope. Wear results of 7 hr homogenized forged sample are lower compared to as cast samples. Pooled error is less than 0.005% Anova ...

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Dear Author(s): Asst. Prof. Mahesh R Latte and Dr. Channappa M Javalagi

Paper ID: 089

Paper Title: The Value Research of Communication and Information Sharing in Supply Chain Management (SCM) for enhancing the Supply Chain Performance (SCP) - A SSI Case Study

This is to enlighten you that the above-mentioned paper is accepted and has been presented virtually at the **6th International Conference on Advanced Production and Industrial Engineering (ICAPIE) - 2021** organized at **Delhi Technological University, Delhi**, India held during **18-19th June 2021.**

The team of CAPIER DTU and ICAPIE-2021 would like to extend congratulations to you.

Prof. Ranganath M Singari
(Conference Chair, ICAPIE-2021)

Dr. Harish kumar
(Convener, ICAPIE-2021)

CERTIFICATE

Dear Author(s): M M Ganganallimath, Manojkumar Balooragi, E.V.Gijo, V S Puranik, Roopa B Math

Paper ID: 142

Paper Title: Comparative Study of Conventional Wood-Pattern with 3D-Print ABS-Pattern to Enhance Quality of Casting

This is to enlighten you that the above-mentioned paper is accepted and has been presented virtually at the **6th International Conference on Advanced Production and Industrial Engineering (ICAPIE) - 2021** organized at **Delhi Technological University, Delhi**, India held during **18-19th June 2021.**

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Abstract	The main function of the supply chain is to satisfy the customer by making use of all the parties such as the manufacturers and suppliers, transporters, warehouses, retailers, and even customer themselves. Within small-scale organization, the supply chain includes all those functions which are involved in receiving and filling a customer request. These functions include, but are not limited to, desired new product development, innovative and cost-effective marketing, systematic operations, well-planned distribution, wisely managed finance, and dedicated customer service. The present case study is the analysis of supply chain management (SCM) in small-scale functional industries, located at two industrial estates, namely Gokul Shirgaon MIDC and Shiroli MIDC in Kolhapur, Maharashtra. These operational units were divided majorly into two parts, manufacturing and logistics, and the study is mainly focused on theoretical & statistical analysis of Inventory management & Warehouse management of small-scale industries. For an effective supply chain model, every company has adopted its own supply chain strategy on the basis of their needs, capacity, and available resources. So, to analyse the SCM in small-scale industry, the relevant information from these industries was collected both from primary and secondary sources. And the relevant information is statistically analysed and verified statistically by using Minitab software, and conclusion was drawn.

Keywords (separated by '-')	Inventory management - Warehouse management

Theoretical and Statistical Analysis of Inventory and Warehouse Management in Supply Chain Management—A Case Study on Small-Scale Industries

Mahesh R. Latte and Channappa M. Javalagi

Abstract The main function of the supply chain is to satisfy the customer by making use of all the parties such as the manufacturers and suppliers, transporters, warehouses, retailers, and even customer themselves. Within small-scale organization, the supply chain includes all those functions which are involved in receiving and filling a customer request. These functions include, but are not limited to, desired new product development, innovative and cost-effective marketing, systematic operations, well-planned distribution, wisely managed finance, and dedicated customer service. The present case study is the analysis of supply chain management (SCM) in small-scale functional industries, located at two industrial estates, namely Gokul Shirgaon MIDC and Shiroli MIDC in Kolhapur, Maharashtra. These operational units were divided majorly into two parts, manufacturing and logistics, and the study is mainly focused on theoretical & statistical analysis of Inventory management & Warehouse management of small-scale industries. For an effective supply chain model, every company has adopted its own supply chain strategy on the basis of their needs, capacity, and available resources. So, to analyse the SCM in small-scale industry, the relevant information from these industries was collected both from primary and secondary sources. And the relevant information is statistically analysed and verified statistically by using Minitab software, and conclusion was drawn.

Keywords Inventory management · Warehouse management

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The Value Research of Communication and Information Sharing in Supply Chain Management (SCM) for enhancing the Supply Chain Performance (SCP) - A SSI Case Study

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Abstract. The importance of communication & information sharing is increasing day by day in today's world of digital supply chain management & there are lots of value research is going on to increase the supply chain performance. In this paper an attempt is made to analyse the communication channels in small scale industries (SSI) & information sharing methods & techniques employed by the SSI. Also the work carried out is a value research for enhancing the supply chain performances.

In this paper a survey is made across selected 7 SSI in the Kolhapur MIDC area. The questionnaire is been prepared for the managers/ Owners & Wholesalers/retailers & Customers for the preliminary data for analysis along with that secondary data is also been collected from different sources on digital platforms & brain storming sessions with the company owners. For statistical analysis we have used SPSS software for factor analysis & used statistical tools such as mean, standard deviation, percentage, t-test, correlation, multiple regression, one way Anova etc and the conclusion is drawn out of the total value research & also some of the useful suggestions were drawn out for the positive increase in the supply chain performance.

Keywords: Communication, information sharing, supply chain performance.

1 Introduction to importance of Communication & Information Sharing

An information and good communication can help to improve the consumption of the supply chain assets and the synchronization of supply chain flows to increase sensitivity and diminish cost. Even though the sharing of data can help a supply chain more but it is better to satisfy customer needs at lower cost, there is a threat in the assumption that additional data is always better. As extra information is shared across the supply chain, the complicity and expenditure of the both required infrastructure and the follow-up analysis rise exponentially. The trivial value provided by the information share, however, lessens as more and more information become obtainable. It is

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Assessing the potentiality of agricultural residues in extending operational period of bagasse-based co-generation plants in India

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Abstract: **Under the signs of extinction of conventional fossil fuels in near future, more emphasis lies now on exploitation of renewable energy sources. The energy production in India from the biomass for the financial year 2017-18 is merely 2.06 percentage of total potential derived from all the renewable sources out of which 0.46 percentage is from cogeneration which is far below their installed capacity. This may be attributed to the fact that cogeneration is pertaining to the utilization of only the bagasse for power production. However, the supply of bagasse is adequate only during crushing season but its non availability for rest of the period leaves those plants inoperative. This void created in the supply of fuel for cogeneration in plants can be filled up through alternative agricultural residues and by managing properly, continued production of power can be ensured. The residues from the nine prime crops are considered for the investigation based on their available energy potential. The power potential of these residues, determined theoretically on the basis ultimate and proximate analyses figures out approximately one million MW of power year on year.**

Key words: Agricultural residue, Biomass Energy, Co-generation, Power Potential

1. INTRODUCTION

Under the signs of extinction of conventional fossil fuels in near future, more emphasis lies now on exploitation of renewable energy sources. The acclaimed reliable sources of renewable energy include solar, wind, biomass and hydro. The estimated energy potential in India from the biomass for the financial year 2017-18 is merely 2.06 percentage of total potential derived from all the renewable sources [1]. In contrast to it, agriculture is a major occupation in India since ages and is capable of producing more and more to meet the ever increasing demand due to swelling population. It also produces large quantity of agricultural residues that are usually considered as waste and the formers burn it in the fields to reduce the cost of cleaning. It is worthwhile estimating the potential of this huge biomass produced in the form of agricultural residue for boosting the productivity in co-generation plants.

Though found in abundance, agricultural residues except bagasse were never been considered as the persuasive sources of energy for power generation. Major agricultural residues that are produced in large quantities every year other than bagasse include sugarcane trash, arecanut shell, coconut shell/coir, groundnut shell, cotton stalk, rice/wheat husk, corn cob etc. Proper utilization biomass results in the production of electricity at cheaper rate and benefits the environment by reducing the greenhouse gases (GHGs) in atmosphere due to their lower emissions as compared to conventional fossil fuels [2-3].

India being a major consumer of electricity in South-Asia contributing to 85% of its total production, is still facing sever power crisis due to its own production falling short by 30% of its demand. In filling this gap cogeneration of electricity using biomass is very attractive due to its low capital investment, short gestation period, reduced fuel consumption and associated environmental pollution and increased fuel diversity [ESCAP, 2000] [4]. It is estimated that the sugarcane production in India is expected to touch 38 million tons during kharif season of 2018-19 [5-6]. Never the less the power produced from cogeneration is just amounts to 0.46 percent of the total power produced from the renewable energy sources. The figure indicates that the potentiality of cogeneration in India has not been exploited to its fullest extent. This may be attributed to the fact that cogeneration is pertaining to the utilization of only the bagasse for power production. However, the supply of bagasse is adequate only during crushing season but its non availability for rest of the period leaves those plants inoperative. This void created in the supply of fuel for cogeneration in plants can be filled up through alternative agricultural residues and by managing properly, continued production of power can be ensured.

2. POTENTIALITY OF AGRO-BASED BIOMASS RESOURCES

About 58 % of population in India is depending on agriculture for their income and contribute to 18 % of

Routing Protocols in VANET- A Survey

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Abstract— Intelligent Transportation Systems (ITS) is an integrated approach being developed to exchange relevant information to increase the safety and efficiency of the road transportation systems. Vehicular Ad hoc Network (VANET), a variant of mobile ad hoc networks (MANET), is a core component of ITS. Performance of this smart ITS mainly owes to the design of efficient routing protocols in VANETs. Distinct features of VANETs like unsteady connectivity, high mobility and partitioning of the network have made routing of the information in VANETs difficult and challenging, hence dictating the development of efficient routing protocols. The computation of the best route measures the performance of communication whereas routing protocols takes care of communication & routing of the data. Provision of smart communication, necessitates the analysis of routing protocols in VANET. Accordingly in this paper we have reviewed various types of existing routing protocols in VANET, listing their advantages and disadvantages. Lastly possible inclinations of forthcoming research linked to VANET routing are discussed.

Keywords: VANET, Characteristics, Routing protocols, Perspectives.

I. INTRODUCTION

The increasing percentage of people depending upon vehicular transportation has steered issues related to safety and traffic jams. VANET is a variant of MANET in which nodes are replaced by vehicles. VANET is the primary component in ITS that is envisioned towards providing road safety and comfort zone to their users [2]. Apart from safety VANET also provides several value added services like audio/video sharing and other multimedia applications etc.

VANET makes the communication between the vehicle drivers, to evade any acute situation e.g. accidents on roads, roadblocks, speed control, unrestricted way for ambulances and concealed obstacles etc. Vehicles communicate among themselves directly making vehicle to vehicle communication (V2V), else communicate with fixed equipment next to the road (RSU) constituting vehicle to infrastructure communication (V2I) [10]. Through these communication variants vehicles exchange varieties of information. Thus Information propagation is very important in a VANET environment. Routing plays a vibrant role in information propagation. Routing in VANET is categorized based on topology, position, clustering, geocast and broadcasting.

The design of dynamic routing protocol itself is the principal challenge in VANET. Exceptional features of VANET like ever altering topologies, varying speed & density of vehicles, etc. makes routing in VANET very puzzling. The designed routing protocols should deal with the unanticipated and pulsating behavior of VANET to yield optimal performance. Above all, computing and sustaining ideal paths is very complicated task associated with routing in VANET. These arresting features and unfamiliar characteristics have indeed made VANET thrilling.

In this paper we have reviewed various types of existing routing protocols in VANET. The benefits and drawbacks of various routing protocols are also discussed. Rest of the paper is structured as: Unit 1.1 presents the distinct characteristics of VANET. In unit 2 various routing protocols in VANET are reviewed. Probable track of future trends related to VANET routing is offered in unit 3. Conclusion is provided in unit 4.

I.1 Characteristics of VANETs:

- *High Mobility*: Owing to the high speed of vehicles in VANETs, taking decisions related to routing and security issues based on guessing node's position is very tricky [6].
- *Rapidly changing Network topology*: In VANET vehicles travel continuously and that too with high speed. Thus the position of vehicle changes repeatedly leading to recurrent topology changes.
- *Unbounded network size*: The range of the VANET is limitless. Thus network extent in VANET is physically uncontrolled [3].
- *Frequent exchange of information*: Owed to the ad hoc nature of VANET frequent information exchange between vehicles and also with RSUs is desired.

II. CATEGORIES OF ROUTING PROTOCOLS

Broadly routing protocols in VANETs are characterized into 5 brands viz. *Topology based, Position based, Broadcast based, Geo cast based and Cluster based routing protocols*[1] [5] as shown in Fig. 1.

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Bezier Curve based Multipath Routing in VANET

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***Abstract*—In VANET environment multipath routing protocols enhance reliability and fault tolerance. However major drawback of the existing multipath protocols is that all the computed paths are not utilized for communication at any given time. Hence this work proposes Bezier Curve based Multipath Routing (BCMR) in VANET. The proposed work computes multiple paths from source to given destination using cubic Bezier curves and more notably engage all or more than one path during the actual communication. Proposed work performs better w.r.t. parameters like packet delivery ratio, transmission time and path discovery time.**

Keywords*—VANET; Bezier curve; Degree of bezier curve; Multipath;

I. INTRODUCTION

Vehicular Ad-hoc network (VANET) is a network of vehicles as nodes without any centralized infrastructure. In VANETs the high mobility of nodes results in frequent destruction of routes. Further, the links over which data is communicated are highly unreliable. In single path routing end to end transmission delay is thus substantially high due to the time involved in the computation of alternate path, when primary gets broken. Multipath routing protocols are employed to tackle the problems associated with single path routing protocols.

Advantages of multipath routing: (1) Minimize delays in data transmission because of link failure. (2) Packet delivery ratio, throughput and delay are optimized. (3) Increased reliability and fault tolerance. (4) It facilitates load balancing [1] [2]. Thus development of efficient and reliable multipath routing is major apprehension in VANETs. Thus development of efficient and reliable multipath routing is major apprehension in VANETs. This has prompted to the development of various routing protocols and algorithms to realize this objective.

In paper [3] authors present a multipath route protocol based on AODV called Enhanced Multipath AODV (EMP-AODV). The approach employs a node-disjoint multipath strategy to compute routing. Data transmission is centered on expected link lifetime algorithm built on velocity of nodes is employed. Authors in [4] propose an adaptive cross-layer multi-path routing protocol (R-S-AOMDV) which is an improvement over AOMDV. Hop-count, quality of link and motion of vehicle information together constitutes routing metric. Authors in [5] present a protocol known as IMAODV (Improved Multicast-AODV) which integrates routing techniques of DSR and MAODV protocols. The protocol works in two phases viz. 1) Route Discovery Mechanism, 2) Route Maintenance Mechanism. Authors in [6] present on-demand multipath protocol, Fast Restoration On-demand Multipath Routing (FROMR).The presented approach focuses on quickly calculating replacement path if the original path is disconnected. The geographic region is divided into equal size square shaped grids. Within every grid, a vehicle which is likely to be there for the maximum period is designated as the leader of the grid. Grid leaders are accountable for all routing activities.

Authors in [7] present a Multipath Route Restoration Protocol (MRRP) that focuses not just on route change in case of link failure due to congestion, but also on the route restoration of the link failure path from source to destination. Authors in [8] paper presents a connectivity-aware intersection based routing (CAIR) protocol. In this technique amongst two intersections on the route packets are communicated by geographical forwarding centered on position prediction. The protocol aims at computing an optimal route with high connectivity and low delay. Authors in [9] present effective approach to forward packets along a trajectory modeled like parametric curve. To encode trajectories into packets at source Bezier parametric curve is employed. Centered on this encoding they have developed and evaluated numerous greedy forwarding algorithms.

However existing systems has certain disadvantages like: (1) Multiple paths are computed, but all the paths are not utilized simultaneously leading to extra overhead of computing multiple paths. (2) They have not taken into account vehicle mobility and issues related to disjoint paths. (3) The authors have not adequately addressed measures to reduce congestion caused by redundant relay messages and (4) Multiple paths are not searched effectively and hence are costly.

In this paper, we propose a new approach which employ cubic Bezier curve to compute multipath between source and destination. The proposed work thus targets to optimize reliability and delay by utilizing all the multiple paths computed. Accordingly information is disseminated to destination vehicle over multipath simultaneously. Our contributions are as follows: (1) Use of Bezier curves to compute multipath. (2) Minimize congestion and network traffic.

The proposed work Bezier Curve based Multipath Routing in VANET (BCMR) is compared with Improved Multicast AODV (IMAODV) [5]. The advantages of proposed approach

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Cluster Based Context Aware Secure Routing in Distributed Sensor Networks

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Abstract — **Distributed Sensor Network (DSN) built with smart sensor nodes by high computing network. A DSN has been attractive platform for researchers from many years and it's to provide effective computing and making secure communication or routing between source and sink node. However, sensor networks are vulnerable in an environment with respect to attacks.**

This paper proposes a cluster based context ware secure routing in DSN by employing Grid Based cluster approach. This approach incorporates efficient cluster head selections, context discovery, context interpretation, and secure routing mechanisms in DSNs. The objective of the proposed work is to improve the effective performance of networks. The proposed work had been simulated in terms of packet delivery ratio, network lifetime, energy consumption, throughput, and packet dropping ratio.

Keywords— **Distributed Sensor Network, Cluster Head, Context Aware, Routing, Cryptography, CMKB, CKB.**

I. Introduction

Distributed Sensor Networks (DSNs) come up with many number of smart sensor nodes. All the sensor networks are severely resource constrained such as energy, computing capabilities, and communication resources [1]. All sensor nodes are connected with one or more sink node or base station with high speed networks. In cluster based network, entire network is divided into number of cluster/grids as per the design requirement. Each cluster/grid has its own cluster head (CH), all cluster member (CM) nodes are used to sense the data, forward it to the respective CH.

A CH collects the information from CM nodes through intra-communication, aggregates the data, and removes the redundant information. CH nodes are intern forwards the aggregated information to the sink node or base station (BS) via single hop or multi hops. To increase the life time of the network, and nodes in the network should stay alive for long duration of time to avoid network failure. In the proposed work, selects sensor node as CH based on the highest residual energy among the sensor nodes within the clusters for some number of rounds. Energy is one of the main constraints in the design of DSN, energy consumption can be reduced by allowing only CH nodes to communicate with base station. It is best practice to understand the parameters, which are suitable for sensor network. Once parameters are identified then it can be easy to evaluate the DSN. It uses the following metrics are: ease of deployment, system life time, latency, load balancing, and quality [2] [3].

Context is any information that can be used to characterize the situation of an entity [4]. It gives the meaning to something in an environment. It can be materialized as identity, activity, location, and time [5]. In the proposed work, use of context to determine the context information that will distinguishes the data priority whether high, medium or low level priority data for routing data in DSN.

Routing is the process of data transfer from source sensor node to destination or sink node [6]. In the proposed work, routing is achieved in two phases, first all possible paths have to be identified from the all CHs in the network. In second phase, according to the context path, data transmission is to be done through the best possible path (trust) across the CHs in the network. Each CH transmits the encrypted data with private key from source node to sink node in the network. It preserves the quality of information and to avoid the malicious attacks over the path. Cryptography plays an important role in data security and it is standard way to provide security in network. The symmetric key algorithm is simulated in the proposed work for data security.

The rest of the paper is organized as follows. The overview of related work discussed in section II. A proposed work context aware secure routing is discussed in Section III. Simulation and results analysis are depicted in Section IV and finally conclude the work in section V.

II. Related Work

Some of the related works are as follows: the work given in [7] presents context aware data aggregation in distributed sensor network. It proposes four different contexts in DSN by considering environment as temperature, context, air pressure context, energy aware context and object aware context. In

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Data Processing in Semantic Sensor Web: A Survey

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Abstract: **- Wireless Sensor Network (WSN) has set of wireless sensor nodes that are used to generate or sense the high volume of raw data from the environment, transmits the data to its respective sink node. The processing of raw data requires more amount of energy from sensor nodes to sink node or base station through single-hop or multi-hop communication over the nodes. In this context, sensor data need to be quality of data with semantic information in terms of semantic data integration and fusion and data processing, and so on.**

In order to problem of semantic data and managing raw data in WSN effectively, the Semantic Sensor Web (SSW) is taken into the wireless sensor networks. The SSW is promising technology for realizing the use of sensor data and semantic web that provide the semantic information to existing sensor networks by utilizing domain, spatial and temporal ontologies and other related semantic technology. This paper presents survey of data processing in SSW from various aspects. Besides, it presents the architecture of SSW and its advantages.

Keywords **– Wireless Sensor Network, Semantic Web, Semantic Sensor Web, and Data Processing.**

1. Introduction

A Wireless Sensor Network (WSN) consist of wireless sensors nodes with high speed of network, which are distributed logically, spatially or geographically over an environment. The WSN is used to provide the following benefits are: reliability, accuracy, flexibility, cost effectiveness, and ease of deployment of sensor nodes. Intelligent sensor nodes of WSN can used to detect and monitor the environment [1] [2].

Sensor nodes frequently sense the raw data from the surrounding environment for processing to the sink node. The frequently sensing of raw data and the number of sensors periodically reports the data to the respective base stations that depend on the particular applications. Semantic data aggregation and integration involves systematically collecting the sensed raw data from multiple sensors, aggregating to suppress the redundant data, and transmitting the aggregated data to the sink node for further processing [3] [4]. WSN is used for various applications like area, habitat, and environmental monitoring, vehicular adhoc networks applications, fire detection, battlefield surveillance and assessments, medical applications, industrial monitoring, target tracking, vigilance monitoring, and landslide monitoring [5] [6].

The semantic web (SW) is an analogy of current web that carries the semantic information to users in the real world environment [7] [8]. That is SW process the data from unstructured or semi-structures web data to semantic data or structures type of data in web. The following are the components of SW: (1) Uniform Resource Identifier (URI)–for identifying and locating services from the web. (2) Extensible Markup Language (XML)–for syntactic representation of text in the web. (3) Resource Description Framework (RDF)–is the metadata model for structuring and linking of data that describes the semantic data to users through semantic web. (4) Semantic Ontologies – for providing richer or semantic data. And (5) SPARQL–is the type of query language for RDF. The users can access the semantic data through SPARQL.

The Semantic Sensor Web (SSW) is an emerging area of research in the current world that gives the great benefits for the future. The SW technology has been introduced in the sensor network in categorize to defeat the problem of lack of meaningful data and also difficult to handle the homogeneous or heterogeneous data in WSN effectively. The SSW is

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Multipath Routing in VANET: Multi-Agent based Approach

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***Abstract*—** In VANET routing of data is a exciting task owing to the high dynamics involved in this network. Delivery of data to the projected destination turns out to be very puzzling. Single path routing suffers from drawbacks like unreliability and etc. To manage such situation multipath data delivery is very nominal. In multipath routing more than one path discovered between source and destination node. Data packet can be sent simultaneously in all paths or data packet can be send by selecting path one after another. It is up to the routing algorithm to select path thoughtfully to deliver data proficiently. However existing multipath routing protocols even though compute multipath, only one path will be engaged in actual communication at any given time. Hence this work proposes Multipath Routing in VANET: Multi-agent based Approach which calculates multiple paths amongst source and destination. Further, all such computed paths will be employed for information dissemination. NS2 simulation of the proposed approach in realistic mobility models show that it can select more stable link and improve the network performance.

Keywords- *Multipath, Node-disjoint, Congestion.*

*****

I. INTRODUCTION

Vehicular Ad hoc Network (VANET) is a variety of network intended for V2V (vehicle-to-vehicle) and V2I (vehicle to infrastructure) communication It is a core part of Intelligent Transportation System (ITS) and is being extensively researched now a days. Unique characteristics of VANET are no energy resource constraint, high mobility patterns, relatively high moving speed. During the transit of information through multi-hop routing, if an intermediate link was broken, the path needs to be rebuilt or restored. Hence, efficient routing protocols are essential to function properly. Multi-path routing protocols aim to compute several paths during the discovery phase between sender and receiver. Such network has been extensively used in battle field, disaster management, under water network etc. Advantages of multipath routing are 1) Load Balancing 2) Fault Tolerance 3) Higher Aggregate Bandwidth 4) Lower Delay 5) Reduced Congestion and improved QoS 6) Higher resiliency 7) Increased network lifetime [1].

Multipath routing protocols compute node disjoint, link disjoint or non-disjoint routes in the course of route discovery Process. Node-disjoint routes have completely disjoint routes where there are no nodes or links in common. Link-disjoint routes have no links in common but may have nodes in common. In an ad hoc network, identification of all node-disjoint paths between a given pair of nodes is a challenging task [2].

Rest of the paper is organized as follows. Section I. A discusses related works. In section I. B methodology is presented. In section II structure of the proposed work is discussed. Network environment is mentioned in section II. A. Section II. B discusses mathematical models. Section II. C describes the proposed agency. The proposed scheme for the work is stated in section II. D. Section II. E describes the algorithm for the proposed work. Simulated model for the proposed work is discussed in section III. Results and analysis are discussed in section IV. Conclusion is presented in section V.

A. Related Work

Authors in [3] propose a novel road topology-aware routing (RTR) protocol for VANETs. To adequately utilize connected routing paths RTR creates two junction-disjoint paths. RTR alternately transfers data packets through each established routing path and dynamically changes the routing path based on the connectivity of the current path. Authors in [4] propose Junction-based Multipath Source Routing (JMSR) a geographic routing protocol which exploits the location of the nodes and street junctions. Two concurrent paths from the source to the destination are preserved as a series of junctions the packets should pass through. Routing information is injected in each packet. As such every node on the path is aware of the route, packets to go ahead. Authors in [5] propose distributedly finding disjoint paths (DFDP) to compute k disjoint paths from source to destination. Further they analyze the relationship between disjoint paths and network parameters like robustness, throughput, and load balancing. Authors in [6] propose link-disjoint, node-disjoint and zone disjoint multi-path algorithms aiming on the compromise between lifetime and hop count of routes for MANET. Authors in [7] evaluate the applicability of node disjoint multipath in VANET environment. Through simulation results author's present that it improves the packet delivery ratio and reduces the end-to-end delay. Authors in [8] present a modified form of AOMDV known as Maximally Spatial Disjoint Multipath routing protocol (MSDM) for MANETs. The data is communicated employing multiple paths which are mostly spatially separated and node-disjoint paths. Results show that spatially node-disjoint routes perform better than AOMDV which selects only link-disjoint paths.

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Multi-Agent Based Context Aware Multicast Routing in VANET

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***Abstract*—** Vehicular Ad-hoc Network (VANET) is a variant of Mobile Ad-hoc Network (MANET).The key goal of VANET is to facilitate communications among vehicles and also amongst vehicles and fixed infrastructure. Regardless of the fact that VANET is considered as a sub-class of MANET, it has distinctive features in terms of high mobility of vehicles, fabricating to recurrent topology changes, random node density and boundless network size. Hence most of the clustering algorithms considered for MANET are inappropriate for VANET. Much of the literature recently published focus on clustering in VANETs. However most of them are concentrated on diminishing network overhead value, number of clusters formed and do not consider the vehicles interests (viz. traffic congestion, looking for petrol pumps, free parking space, etc.). To decrease the complexity of transmissions, only context-aware data is required to be communicated to the intended recipients as needless information may cause a performance bottleneck in VANETs. Hence in this paper, we propose a context aware multicast/clustered routing algorithm based on agent technology which addresses above mentioned issues and improves the performance parameters associated with routing in VANET. The performance of the proposed scheme is tested with respect to bandwidth consumption, cluster formation time, multicast grouping time and communication overhead.

***Keywords*—** VANETs, Cluster, Multicast, Context, Interest.

I. INTRODUCTION

Vehicular ad-hoc network (VANET) is currently emerging technology which features many safety applications for transportation on roads. However, owing to the random mobility of vehicles in VANETs, communication links are frequently disconnected leading to regular change in network topology. Many of the existing routing protocols are prone to the consumption of high bandwidth and to the overhead associated to route discovery. Clustering forms a virtual communication backbone that facilitates efficient data delivery in VANETs. The consumption of scarce resources such as bandwidth is minimized [1]. In VANET, broadly two approaches are employed for clustering of vehicles: Static clustering and dynamic clustering. Static clustering is formed between Vehicles and fixed Infrastructure (V2I). In this communication Road Side Units (fixed infrastructure) act as static cluster heads [2]. To facilitate real-time communication and connectivity with the Internet all the vehicles are basically connected with Road Side Units (RSU). However, owing to the large distance between the RSUs, the vehicles with high mobility are not always connected to the RSUs. Dynamic clustering is formed amongst vehicles (V2V) and cluster heads are elected from cluster members. Thus dynamic clustering method eliminates the idea of static cluster heads. The dynamic clusters are in motion on the road and vehicles either join or leave the clusters according to their speed and proximity to identified cluster heads. As V2V communications are more flexible and independent of the roadside conditions, they are particularly attractive for the most developing countries or remote rural areas where the roadside infrastructures are not necessarily available [3] [4]. Some of the advantages of clustering in VANETs are (1) Entire network can be divided into smaller groups of moving vehicles. This also facilitates the usage of different protocols within and outside clusters (hierarchical routing) [5]. (2) Efficient usage of bandwidth, routing, distribution of resources and scalability (3) Better routing and network lifetime, Support scalability of network (4) Routing path is limited to the cluster head, thus leading to small sized routing tables, reducing the bandwidth demand and efficient use of limited channel bandwidth (4) Eliminate the redundant and highly tedious route discovery process. (5) Users can be classified into separate groups based upon their interests.

The main purpose of the clusters will be essentially to manage a specific region. As the vehicles continuously move in and out of the cluster to which they belong, their position also change frequently and links between vehicles will be regularly broken. This necessitates the development of alternative stable approach for the formation of clusters. Thus it is very important to consider the context information, viz.

Face Recognition Through Symbolic Data Modeling of Local Directional Gradient

Shanmukhappa Angadi & Vishwanath Kagawade

Conference paper | First Online: 17 November 2017

Abstract

Face recognition systems are vulnerable to changes in expression, light, and occlusion factors. This paper presents a robust face recognition algorithm that effectively deals with these variations. The algorithm is based on the local directional gradient features that exploit the edge information in multiple directions, modeled as symbolic data object . First, face parts are detected and cropped from the face images, then the cropped images are resized to 64p × 64p grayscale images. Further, local directional gradient-based features are computed based on co-relation between pixel elements in multiple directions. The extracted directional gradient features (GC) are represented as a symbolic data object. For classification , a new symbolic similarity measure based on content is devised and employed. The experimental

Iris recognition using savitzky-golay filter energy feature through symbolic data modeling

Publisher: IEEE Cite This PDF

Shanmukhappa A. Angadi ; Vishwanath C. Kagawade **All Authors**

Abstract:
The iris has remained a preferred biometric trait compared to other biometrics because of its uniqueness, stability properties. However, degraded iris images captured under less constrained acquisition setups and varying lighting conditions will affect the performance of iris based biometrics systems. This paper presents a novel method for iris recognition through symbolic modeling approach and also investigates the applicability of Savitzky-Golay filter for iris feature extraction. The approach also proves that the symbolic representation effectively

Iris recognition: A symbolic data modeling approach using Savitzky-Golay filter energy features

Publisher: IEEE Cite This PDF

Shanmukhappa A. Angadi ; Vishwanath C. Kagawade **All Authors**

Abstract:
This paper presents a novel approach for iris recognition through symbolic modeling and symbolic similarity analysis of iris features, which are transformed using Savitzky-Golay filter. The proposed approach is based on iris Savitzky-Golay filter energy features. Prior to symbolic modeling of iris feature data, Canny edge detector and Hough Transform technique is used to segment iris region from the eye image. In the normalization stage, Daugman's rubber sheet model is used to obtain a fixed size rectangular block from segmented iris region

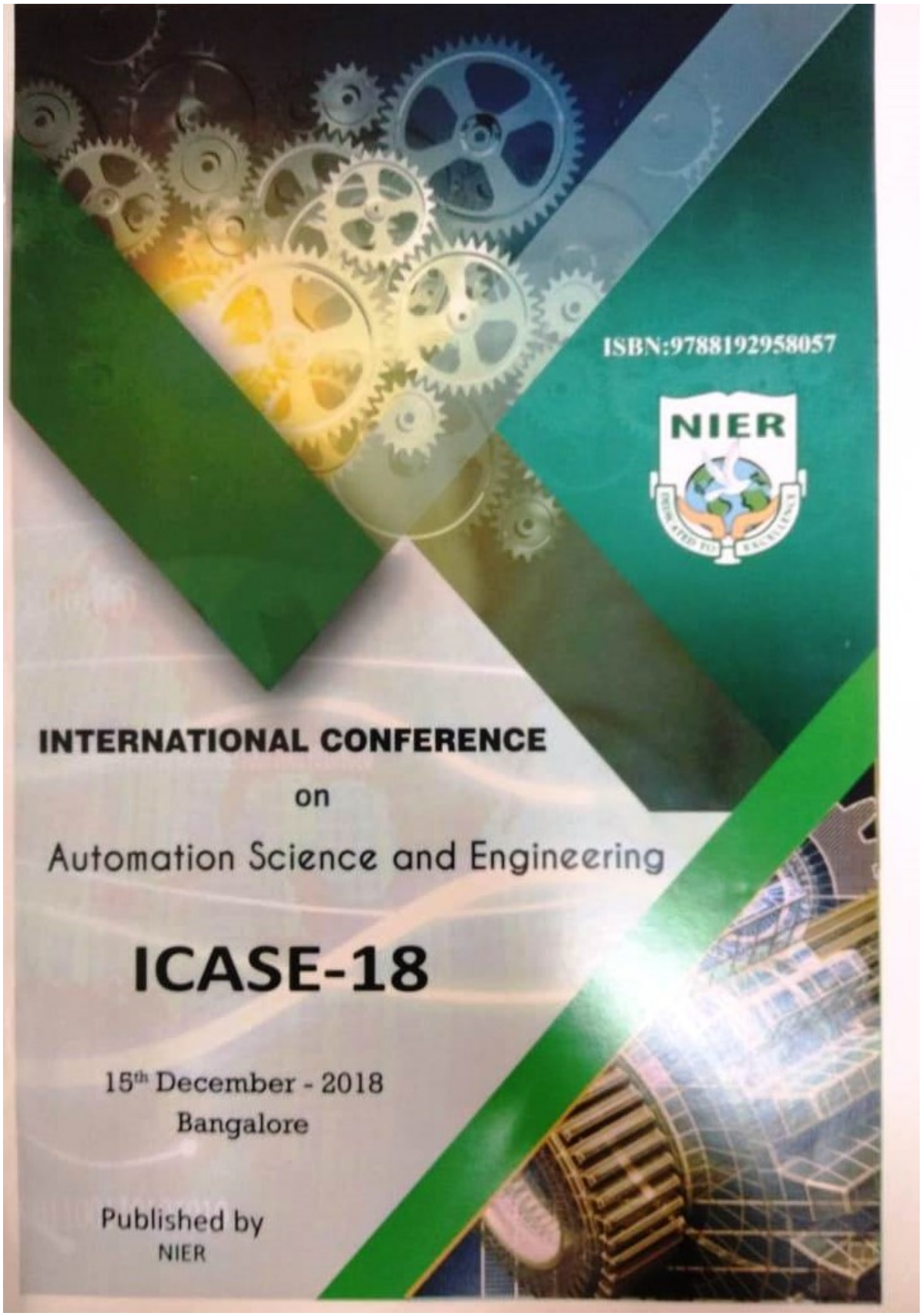
Multiclass classification of kirlian images using svm technique

Publisher: IEEE

Chandrashekhar S. Janadri ; B. G. Sheeparamatti ; Vishwanath Kagawade All Authors

Abstract:

Every organism emits energy around it which comprises UV-radiation, EM-radiation, infrared and thermal radiation. This energy around human body represents health condition of the subject under study. These energy fields are called as aura of the body under consideration. Several types of equipments are there to capture such energy. Kirlian camera captures the distribution of energy radiation around each finger of both hands and maps them into energy distribution various organs of our body. In this work classification of human diseases based on Kirlian image features is done. Few Kirlian images in each of the 6 different categories of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CONTENTS

FEM for Stress Reduction by Optimal Auxiliary Holes in a Loaded Plate with Elliptical Hole

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Abstract: — **Steel is widely used in machine parts, structural equipment and many other applications. In many steel structural elements, holes of different shapes and orientations are made with a view to satisfy the design requirements. The presence of holes in steel elements creates stress concentration, which eventually reduce the mechanical strength of the structure. Therefore, it is of great importance to investigate the state of stress around the holes for the safety and properties design of such elements.By literature survey, it is known that till date, there is no analytical solution to reduce the stress concentration by providing auxiliary holes at a definite location and radii in a steel plate. The numerical method can be used to determine the optimum location and radii of auxiliary holes. In the present work plate with an elliptical hole, for a steel material subjected to uniaxial load is analyzed and the effect of stress concentration is graphically represented .The introduction of auxiliary holes at a optimum location and radii with its effect on stress concentration is also represented graphically. he finite element analysis package ANSYS 11.0 is used to analyse the steel plate. The analysis is carried out using a plane 42 element. Further the ANSYS optimization model is used to determine the location and radii for optimum values of auxiliary hole to reduce stress concentration. All the results for different diameter to plate width ratio are presented graphically. The results of this study are in the form of the graphs for determining the locations and diameter of optimal auxiliary holes .The graph of stress concentration v/s central hole diameter to plate width ratio .**

The Finite Elements results of the study indicates that the stress concentration effect of central elliptical hole in an uniaxial loaded plate can be reduced by introducing auxiliary holes on either side of the central circular hole.

Key words: **Finite Element Method, Optimization, Stress concentration factor, auxiliary holes.**

I. INTRODUCTION

THE failure of structures due to stress concentration at any discontinuity has been baffling engineers for long. It is found that structure failures in ships, offshore structures, boilers or high rise buildings subjected to natural calamities is due to stress concentration. problem of determining stress distribution around holes in a plate has been treated extensively in the literature. T. Hasan [2] has reported stress analysis of steel plate having holes of various shapes, sizes and orientations using finite element method. Finite element analysis is carried out by using the commercial software. Effects of hole shapes are critically analyzed and results are compared with analytical method which showed good agreement with the results. A.J.Durelli, V.J.Parks and H.C.Feng[3] presented Photoelastic solution of the distribution of stresses around a centrally located elliptical hole in a plate of finite width subjected to uniform axial loading and reported stress distribution at the boundaries for a wide range of the parameters, and stress concentration factors have been computed for the points of maximum tensile and maximum compressive stress.

Ukadgaonkar [4] has given a new approach of stress analysis of an infinite plate with elliptical hole or crack with tensile stress .The closed form equations for SCF are given for anisotropic plate. According to the study SCF in flat plate with different geometry can be reduced by introducing auxiliary holes. The location of auxiliary holes from the center of ellipse has to be reported.

G. V. Kolosoff and C. E. Inglis [5]: proposed boundary element method to the problems of anisotropic plates containing multiple various shaped holes, this research solves the stress and strain fields numerically by embedding the fundamental solutions of polygonal holes into boundary element method (BEM), and using the technique of sub region. In the literature, most of the examples of multi-holes consider elliptical holes due to the geometry restraints; it limits the range of the problems. Since the fundamental solutions have satisfied the boundary condition for holes, it's unnecessary to descretize the hole boundary. Since, the fundamental solutions are for the polygon-like holes, their associated BEM would be able to solve multi-holes much more effectively.

There is extensive literature which uses finite element method (FEM) to optimize the stress concentration but not used for auxillary hole optimization for stress reduction.

In the present work FEM optimization was carried to determine the optimum sizes and location for the auxiliary holes for different center elliptical hole diameter to plate width ratios were minimization was achieved for all possible ratios.

II. DESCRIPTION OF THE PROBLEM

To examine the stress distribution around the original hole and to study the effect of auxiliary hole on stress

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ASSESSMENT OF STRESS REDUCTION TECHNIQUES IN AN UNIAXIALLY LOADED PLATE WITH A HOLE

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Abstract - Stress concentration in a rectangular plate with central hole under static loading, have found widespread applications in various fields of engineering such as Aerospace, Marine and Automobile. For design of plates with hole, accurate knowledge of deflection and stress are required. Stress concentration arises from abrupt change in geometry of plate under static loading. As a result, stress distribution is not uniform throughout the cross section. Various stress reduction techniques are available to determine stress concentration factor under different loading conditions such as experimental, analytical and numerical method. Though experimental methods give the most reliable results, it is very costly, as it requires special equipments, testing facilities etc. Analytical solution of every problem is almost impossible because of complex boundary conditions and shapes. For this reason the numerical methods had become the ultimate choice by the researchers in the last few decades. In the present paper an attempt has been made to review various stress reduction techniques.

Index Terms - Stress Concentration Factor, Auxiliary Holes.

I. INTRODUCTION

Most of the engineering applications consist of assembly of simple elements, which are connected to each other by joints. Joints or connections that are usually made in steel structures are mechanical fastening using bolts or rivets. In the mechanical fastening, holes are made to place the bolts or rivets; these make the structure weak and susceptible to failure. Therefore, it is necessary to investigate the state of stress around the holes for the safety and proper design of such structures. From the point of view of the above facts, it is of great importance to understand the behavior of the steel structures with holes.

II. STRESS CONCENTRATION

The referenced collection of stress concentration factor data is in Peterson [1]. This book compiles the theoretical and experimental results of many researchers in to useful design charts from which the values of stress concentration kt (for normal stress), for various geometric parameters and types of loading can be read. Rorak and Young [2] also provide tables of stress concentration factors for a number of cases. The ratio of the maximum stress over the average stress computed in the critical section of the discontinuity is kt= σmax/σapp

Where σmax and σapp are the maximum stress and applied stress, respectively. The value of kt was plotted by Frocht (discussed by Beer and Johnston [3]). Amelio M. D'Arcangelo [4], investigated the variation of the maximum stress concentration factor as a function of the corner radius to the opening width ratio in a rectangular plate with a central hole. Therefore, more study or more investigation is required to minimize the stress concentration effects of the structure.

III. LITERATURE REVIEW

The stress distribution around holes in a plate has been treated extensively in the literature. An experimental solution was given by P. E. Erickson and W. F. Riley[5] in the year 1978, which was carried using Photoelastic method. They obtained the photoelastic isochromatic fringe pattern. Fig.1.

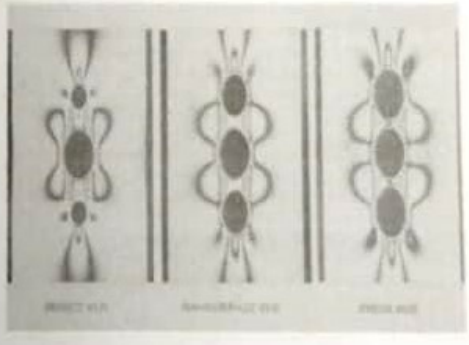

Fig.1. Photoelastic isochromatic fringe patterns from a model with auxiliary holes[4]

The results of the study indicates that, the stress concentration effects of a central circular hole in a uniaxially loaded plate can be reduced by 13 to 21 percent by introducing auxiliary holes on either sides of the central hole. Such a reduction of stress amplitude could have a significant effect on the fatigue life of a part.

A considerable reduction in stress concentration can be observed by the experiments conducted by K Rajaiah and N K Naik [6] Fig.2.

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