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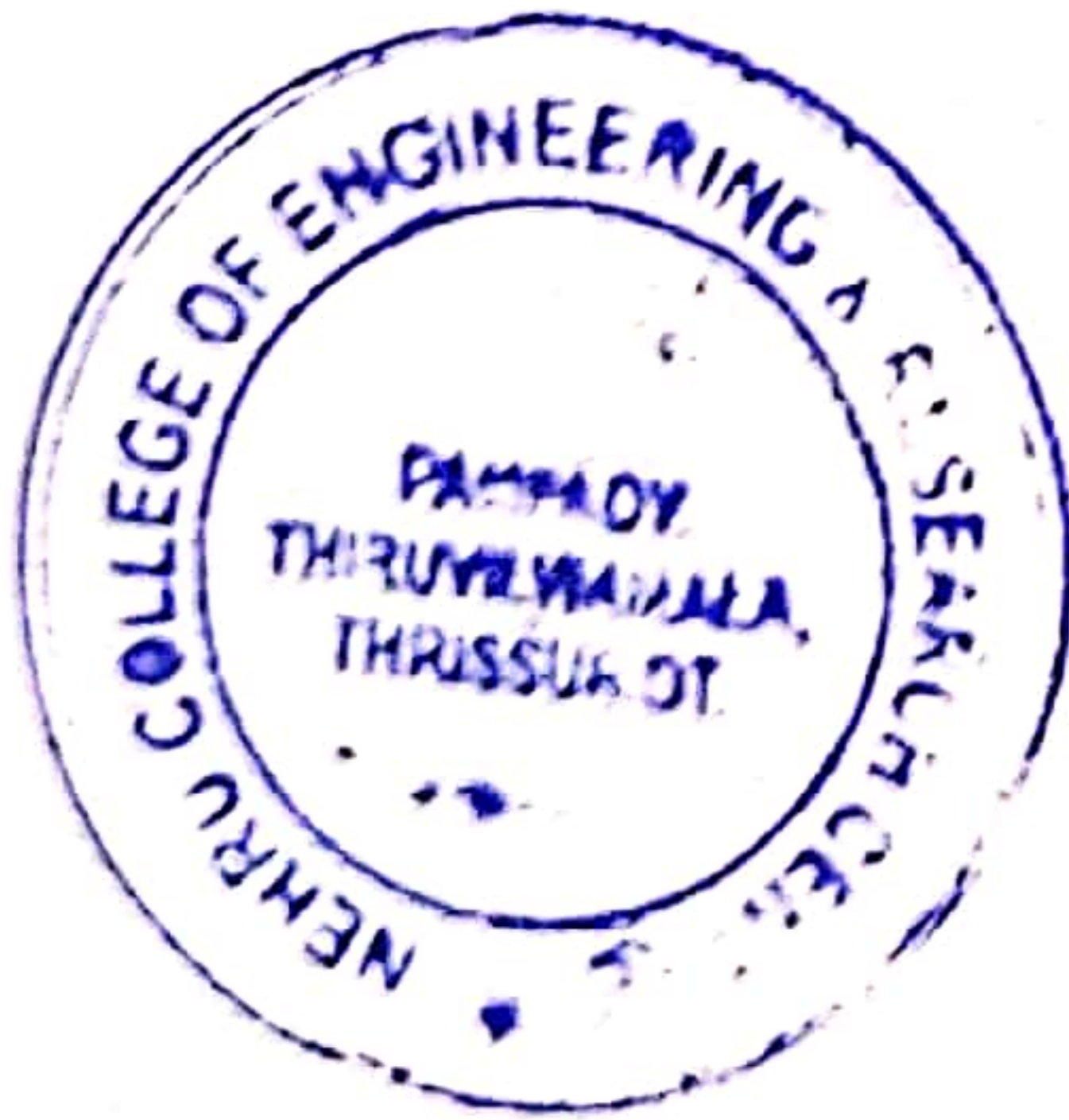
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3.3.2 No. of research papers per teachers in the journals notified on UGC Website during the last 5 years

Sl. No	Academic Year	Page No
1	2019-2020	2
2	2018-2019	18
3	2017-2018	33
4	2016-2017	62
5	2015-2016	121




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ACADEMIC YEAR

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Error Correction Codes Using Burst and Random Errors for Multiple-Cell Upsets in Space Application

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Abstract: In space application, signals are transit from earth to space. Due to transition, radiation may occur. Thus, the probability of occurrence of Single-Cell Upsets (SCUs) or Multiple-Cell Upsets (MCUs) augments. One of the main causes of MCUs in space applications is high cosmic radiation. A common solution is the use of Error Correction Codes (ECCs). In this paper, compare the burst errors with random bit errors in ECCs and also a series of new low-redundant ECCs has been presented. These new ECCs improve the behaviour of the well-known able to correct MCUs with reduced area, power, and delay. Also, these new codes maintain, or even improve, memory error coverage with respect to Matrix and CLC codes. Currently, faults suffered by SRAM memory systems have increased due to the aggressive CMOS integration density. Nevertheless, when using ECCs in space applications, they must achieve a good balance between error coverage and redundancy, and their encoding/decoding circuits must be efficient in terms of area, power, and delay. Different codes have been proposed to tolerate MCUs. A common property of these codes is the high redundancy introduced. FUECs codes have been designed to MCUs in space applications which allow correction up to 4-bit adjacent errors. FUEC-DAEC maintains coverage best, obtained results show that the proposed scheme is 11.438ns, 391nm², 345µw of delay, area, and power respectively. Beyond 4-bit burst errors, the performance of our codes decreases notably due to their low redundancy. Here introducing various random error bits to compare the burst error's redundancy. And also designed DMC codes (up to 4-bit) .D-DMC maintain the low area, power, and delay of 10.402ns, 538nm², 410µW respectively over than other DMC. Comparing these two methodologies, D-DMC has low delay than FUEC-DAEC but FUEC-DAEC has low area, and power than D-DMC with an improved capability of error correction and detection.

Keywords: Error correction code (ECCs), multiple-cell upsets (MCUs), FUECs, DMCs, redundancy.

I. INTRODUCTION

Presently, AS CMOS technology scales down to nanoscale and memories are combined with an increasing number of electronic systems, the soft error rate in memory cells is rapidly increasing with a great storage capacity. Nevertheless, this size decreasing has also caused an augment in the memory fault rate [1], [2], [3]. With the present aggressive scaling, the memory cell critical charge and the energy needed to provoke a single-event upset (SEU) in storage have been reduced [4]. As shown by different experiments, in addition to traditional single-cell upsets (SCUs), this energy reduction can provoke multiple-cell upsets (MCUs), that is, simultaneous errors in more than one memory cell induced by a single particle hit [5]-[9]. In the case of space applications, the MCU problem must be taken into account for the design of the corresponding fault tolerance methods, as space is an aggressive environment subjected to the impact of high-energy cosmic particles [5].

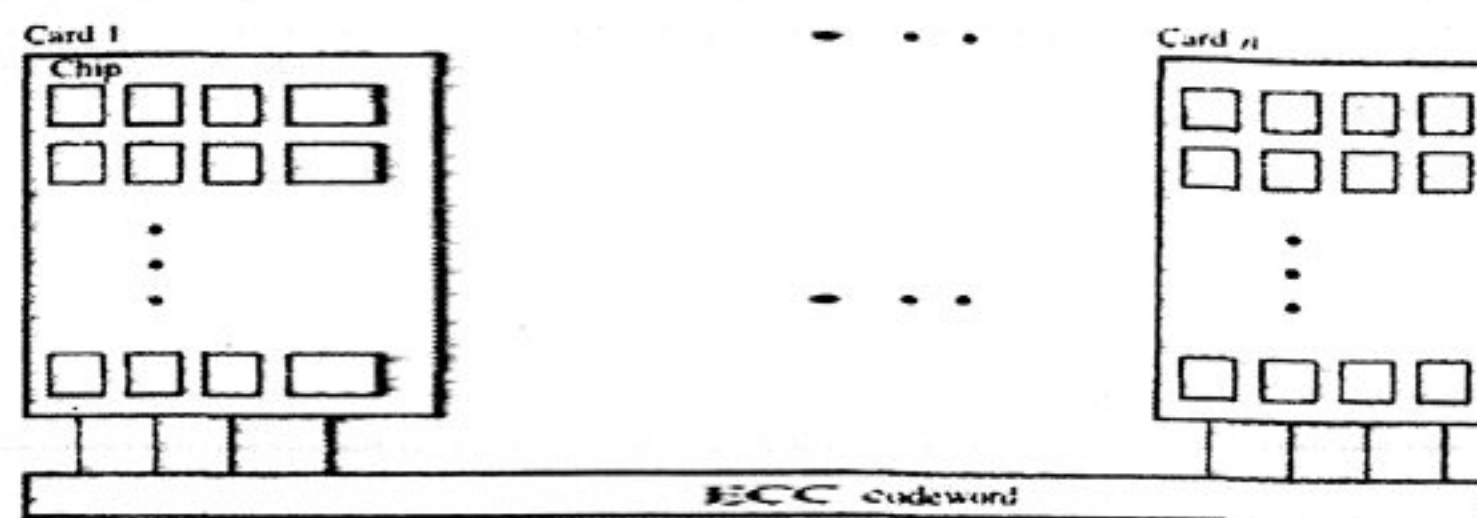


Fig. 1 A 4-bit-per-card memory array

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An Effectual Ga Based Association Rule Generation and Fuzzy Svm Classification Algorithm for Predicting Students Performance

E.Chandra Blessie, K R Vineetha,

Abstract— This investigation provides outcome of utilizing educational data mining [EDM] to design academic performance of students from real time and online dataset collected from colleges. Data mining is determined to examine non-academic and academic data; this model utilizes a classification approach termed as Fuzzy SVM classification with Genetic algorithm to attain effectual understanding of association rule in enrolment and to evaluate data quality for classification, which is identified as prediction task of performance and academic status based on low academic performance. This model attempts to predict student's performance in grading system. Academic and student records attained from process were considered to train models estimated using cross-validation and formerly records from complete academic performance. Simulation was performed in MATLAB environment and show that academic status prediction is enhanced while hybrid dataset are added. The accuracy was compared with the existing models and shows better trade off than those methods.

Index Terms— Educational Data Mining, Fuzzy SVM, Genetic, academic performance, academic records

I. INTRODUCTION

Education is extremely a significant issue that is related to the development of country, specifically in growing countries like India, where education is a factor powerfully related to social mobility; henceforth, to recognize students at risk while analyzing academic performance effectually, and to recognize the factors has higher influence over this [1]. For this, data mining approach is more appropriate tool to deal with these tasks.

Analytics application in education has raised context in few decades. In [2], et al. has three drivers for evaluating it: initially, volume of data that has been collected from any educational institutions has significantly augmented, whether from learning management systems or course management or student information systems. Next, e-learning utilization: although it helps in aggregating data and brought certain learning issued like possible motivation lack and complexity for educators to attain feedback considering level of interest, mood or students understanding; at last, countries are attaining superior understanding of significance of education in development and have an focus to enhance better learning opportunities that causes to superior outcomes.

Based on these circumstances, DM approaches have been used in administrative crisis and Learning crisis, however with superior concentration on automated discovery. In latter process, consider educator- or learner oriented.

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In initial process, concentration is predominantly on students to study successfully by recommending novel contents. At last, the aim is to offer educators with tools to authorize, therefore direct learner effectually. Subsequently, in application towards administrative issues in data warehouses or business intelligence tools helps to assist DM procedure.

DM application in Education field is specified as Education Data Mining (EDM) and it is described as International Education DM Society as, "emerging field, related to approaches for exploring various data that emerges from educational settings, and utilizing these techniques to superior recognize students and learn in". Based on these approaches of EDM, the author in [3] examines classification as trails: Clustering, recognition, data distillation for judgment, prediction and model discovery. In [4] et al, recommends diverse taxonomy sourced on educational tasks: Offering feedback, examining and visualization, predicting performance, suggestion, student modelling, detecting behaviour, grouping students, developing concept map, social network analysis, constructing courseware, planning and scheduling [5]. Moreover, in EDM, data mining application and its task are similar: Clustering, Classification and Association rules analysis are included in KDD.

Here, two data mining classification are anticipated to analyse students' academic performance at time with socio-economic data, however based on academic records. Numerous circumstances are analyzed based on data utilized. It is an extended version of investigation titled DM to analyze performance of students.

The work is structured as trails: Section II offers certain EDM background and works; section III offers datasets, pre-processing, classification models for calculating academic success is explained. Section IV problem statement and section V demonstrates experimental and evaluation outcomes of proposed model; section VI shows conclusion a future direct of research work.

II. RELATED WORKS

An essential feature of classification approach is that is can be constructed based on the part of data, and as well termed as training set, which is utilized to learn model. Based on attributes subset, these are considered as class. After construction of model, it is utilized to allocate label to records, class attributes are unidentified

So as to construct this model, two extensively utilized approaches are used: Bayesian classifier and decision trees. Black box models like SVMs and ANNs are also found in literature however it was not utilized in this work.

In general, DT is representation comprises of arcs and nodes in which



Conscientious Ant Colony Optimization Based Support Vector Machine for Text Document Classification

Deepa A, E. Chandra Blessie

Abstract: Document classification indicates the keyword extraction and it become a thrust research in text mining research. The main purpose of keyword extraction is to classify the documents in a more efficient manner. Misclassification of documents may lead the results to worst case. Hence, there exists a need for optimization to precede the document classification more efficiently. In this paper Conscientious Ant Colony Optimization based Support Vector Machine is proposed to classify the documents. Different keyword extraction methods are available for extracting the contents from documents. Proposed classifier is ensemble with selected keyword extraction methods to increase the classification accuracy. Results shows that the proposed classifier has got better accuracy when ensemble with different keyword extraction methods. The results show that the proposed classifier has better performance in terms of Classification Accuracy and F-Measure, than baseline classifiers.

Key words: Classification, ACM, Mining, NBA, Reuters, Text

I. INTRODUCTION

The main task of document classification is grouping. Grouping is the process of categorizing the document based on its content. Classification of document is an important research problem which is at the main part of information management and retrieving tasks. Classification of document plays a crucial role in multiple applications. that handles searching, organizing, and indicating the maximum amount of specific information. Classification is a prolong problem that exist in the domain of information retrieval. Classification of document can be segregate into three different categories, which are (i) unsupervised learning based classification of which are (i) unsupervised learning based classification of document, (ii) supervised learning based classification of document, and (iii) semi-supervised learning based classification of document. In unsupervised learning based classification of document. no external information is provided to the algorithm for classifying the document. In supervised learning based classification of document, external information related to documents are provided as input to the algorithm for classifying the document.

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In semi-supervised learning based classification of document, partial inputs related to documents are fed as input to algorithm in the form of labels to the document.

Two important factors of classification of document are (i) extraction of features, (ii) ambiguity of topic. Extraction of features handles by picking the best features that correctly describe the document and assist in the developing of the better classification model. Ambiguity of topic is somewhat complicated when comparing with extraction of features, due to the difficulties faced during categorizing.

In everyday of life, problem of misclassification arises due to high dimensional feature-space. Due to the availability of increased set of words for extracting the feature for selection, the classification process becomes tedious and consumes more time. Hence, the need of optimization arises to classify more accurately with less time. This paper aims to propose ant colony optimization based support vector machine for classifying the documents.

II. LITERATURE REVIEW

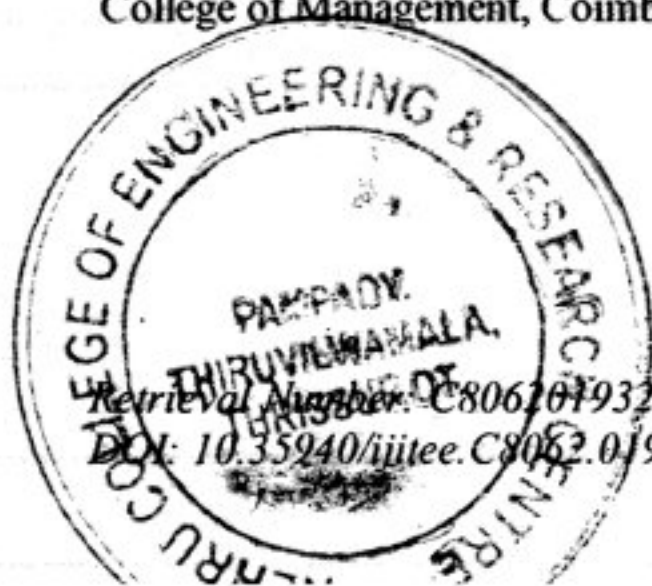
Morphological Evaluation [1] proposed to analyze the sentiments in text by utilizing deep learning based classification. Preprocessing cum normalization used to enhance the results, but the results lead to low accuracy in classification. Efficient Text Classification [2] proposed to reduce the terms and weights assigned to text in classification. It mainly focused to identify frequency and concentrated in indices that occur in text. Over fitting problem got raised and degrades the rate of precision and recall. Cluster Classifier [3] proposed to classify the high-level dimensional text data that have multiple classes. It holds the set of clusters determined to identify the formation of new clusters. Subtrees generated to enhance the classification accuracy, but it has degraded the results with increased enhanced false positives.

Data Treatment Strategy [4] proposed to generate compound features for classifying the text. Compound features allowed co-occurring any number of times in the document to increase the classification accuracy. But the increased co-occurrence has decreased the accuracy of classification. Text Report Classification [5] proposed classify the radiology report for identifying the disease. Two deep learning methodologies were proposed for enhancing the classification efficiency, but it wasn't matched with identification of diseases and ended with low accuracy. Semi-Supervised Algorithm [6] proposed to classify text based on rough set cum ensemble learning. Dual classification used for classifying the text by labeling the data. Unlabelled data were used for learning the dataset.

The theory of tolerance

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Real Time Facial Expression Recognition Based On Deep Neural Network

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Abstract: Now-a-days with the continued development of artificial intelligence facial emotion recognition has become more popular. The emotion recognition plays a major role in interaction technology. In interaction technology the verbal components only play a one third of communication and the non-verbal components plays a two third of communication. A facial emotion recognition (FER) method is used for detecting facial expressions. Facial expression plays a major role in expressing what a person feels and it expresses inner feeling and his or her mental situation or human perspective. This paper aims to identify basic human emotions with the combination of gender classification and age estimation. The facial emotions such as happy, sad, angry, fear, surprised, neutral emotions are considered as basic emotions. Here proposes a real time facial emotion recognition system based on You Look Only Once (YOLO) version 2 architecture and a squeezeNet architecture. The yolo architecture is a real time object detection system. Here it used for identify and detect faces in real time. These images are captured by using anchor boxes for accuracy. The second architecture is squeezeNet and is used for gender classification and age estimation. It provides significant, accurate object detection and extracts high-level features that help to achieve tremendous performance to classify the image and detecting objects. Both the architectures provide accurate result than other methods with the large no of hidden layers and cross validation in the neural network.

Keywords: Artificial Intelligence (AI), Convolutional Neural Network (CNN), Emotion recognition, Facial expression recognition (FER), YOLOv2.

1. Introduction

Facial expression recognition technology uses biometric markers to identify and predict human emotions in the human face. It is a sentiment analysis tool that can be able to detect the six basic emotions such as happy, sadness, surprise, fear, disgust and anger. Facial expression recognition or computer-based facial expression recognition system is important because of its ability to mimic human coding skills. Facial expressions and other gestures convey nonverbal communication cues that play an important role in interpersonal relations. These cues help the listener to understand the intended meaning of the

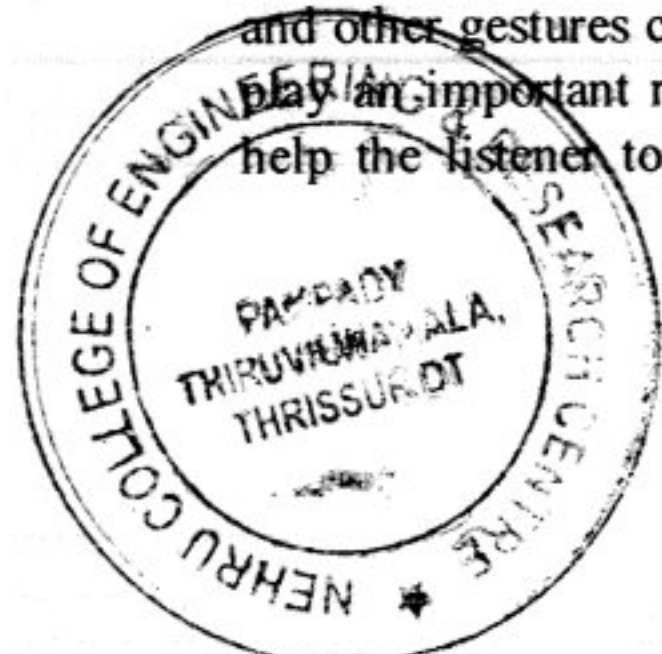
sentences. Therefore, facial expression recognition, because it extracts and analyzes information from an image or video feed, it is able to deliver unfiltered, unbiased emotional responses as data. Similarly, artificial intelligence voice recognition technology using the sense of hearing and AI speakers has been commercialized because of improvements in artificial intelligence (AI) technology. Through the use of such technologies that recognize voice and language, there are artificial intelligence robots that can interact closely with real life. By using these information's the robots or the other systems can manage the daily schedules of people and playing their favorite music. Research is a process of arriving at an appropriate solution to a problem through a systematic approach. Technologies for communication have traditionally been developed based on the senses that play a major role in human interaction. In particular, artificial intelligence voice recognition technology using the sense of hearing and AI speakers has been commercialized because of improvements in artificial intelligence (AI) technology. Through the use of such technologies that recognize voice and language, there are artificial intelligence robots that can interact closely with real life, in such ways as managing the daily schedules of people and playing their favorite music. However, sensory acceptance is required for interactions more precisely mirroring those of humans. Therefore, the most necessary technology is a vision sensor, as vision is a large part of human perception in most interactions. In artificial intelligence robots using interactions between a human and a machine, human faces provide important information as a clue to understand the current state of the user. Therefore, the field of facial expression recognition has been studied extensively over the last ten years

2. Comparative Study

C. A. Corneanu [1] proposed a system based on RGB, 3D, Thermal, and Multimodal Approaches for Facial Expression Recognition. It is an automatic facial expression analysis and


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Security and Privacy Preserving Deep Learning Framework that Protect Healthcare Data Breaches

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Abstract: Big healthcare data security and privacy are a big concern increasing year-by-year. Heterogeneous data called big data, plays overwhelming role in medical industry. More than 750 data breaches occurred in 2015. The top data security breaches occurred from health care industry. The most important data security issue occurs during sharing sensitive data to train the system. There are several methods to protect the privacy of such healthcare data. Among them a distributed deep learning method called SplitNN, is the one which does not share raw data or model details with collaborating institutions (hospitals). Another method is sequentially sharing models in cyclic in order to train deep neural networks. Another approach is synchronous optimization approach which is empirically validated and shown to converge faster and to better test accuracies. The existing systems uses anonymization techniques to protect the privacy. The proposed deep learning framework keep patient's original data in local platforms and send gradient values to the client and back propagate the data without any anonymization. The learning performance improves by using data from different platforms (hospitals) during training.

Keywords: Anonymization, Bigdata, Back Propagation, Data Security, Gradient, SplitNN, Synchronous Optimization.

1. Introduction

The healthcare industry is witnessing an increase in sheer volume of data in terms of complexity, diversity and timeliness, which termed as BIGDATA. Big Data is a high volume, and high speed, high variety data quality, which needs new varieties of processing to enhance increased decision-making insight discovery, and process optimization. Bigdata implies many changes compared to traditional techniques in three ways: the amount of data (volume), the rate of generation and transmission of data (velocity) and the heterogeneity of the types of structured and unstructured data that it can handle (variety). These are known as 3Vs of bigdata. It is known that the new technologies arises many problems, in bigdata not only

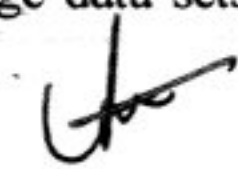
issues having issues with 3Vs but with privacy and security of bigdata. Researchers can use data in EHR systems to create deep learning models that will predict certain health-related outcomes such as the probability that a patient will contract a disease. Deep learning is an assistance to the healthcare professionals to analyse any diseases and predict accurately. But the major issue while developing such deep learning framework is security and privacy. It is important to secure existing healthcare big data environments due to increasing threats of breaches and leaks from confidential data. The distributed deep learning method called SplitNN, which proposes a training of distributed deep learning models without sharing model architectures and also not sharing raw data to prevent undesirable scrutiny by other entities. In order to train deep neural networks while preserving the privacy of dataset proposes a method that sequentially sharing models in cyclic order during training procedures.

A. Note on the technology

The phrase big data mean a massive volume of structured and unstructured data. It helps in decision making, and process automation. Bigdata helps to gain complete answers because more data is available, which means a complete different approach to tackle a problem. Machine learning helps the systems to automatically learn and improve from experience. It can access data and use it learn for themselves. To extract higher level features from the raw input in deep learning uses multiple layers. Artificial neural networks are used in modern deep learning. The data in each level learns to represent in more abstract and composite form.

B. Security and privacy in healthcare

In healthcare Adoption of big data increases security and patient privacy concerns. Data centres stores data with varying levels of security. The inflow of large data sets from diverse



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IoT Based Landslide Detection and Monitoring System

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Abstract: Landslide is a natural disaster and it occurs due to natural or manmade activities. A landslide is defined as the movement of a mass of rock, debris, or wide range of ground movement. Landslides are a type of "mass wasting," which denotes any down-slope movement of soil and rock under the direct influence of gravity and it damaging the social life every year. India also faced the loss of humans due to landslides which occurred last few years during monsoon in Kerala. The aim of the proposed system is to detect that condition which leads to the occurrence of landslide and notify it well before time. And necessary steps can be taken to reduce or save the human loss. The system uses soil moisture and accelerometer sensors. Soil Moisture sensor measures the moisture content in the soil whereas accelerometer monitors the movement of land. The readings crossing the defined thresholds give an alarm to local citizens in the form of message through GSM. The sensed data are also transmitted via MQTT protocol to the Raspberry Pi (Rpi) used in the monitoring station. Raspberry pi is interfaced with a laptop to display the SAFE, MIDDLE and DANGER zones. All the readings from Rpi are also uploaded to IoT cloud for future analysis. The system takes only less time to collect data from sensors and transmit it to Rpi and also to upload data from raspberry pi to IoT cloud.

Keywords: Soil moisture sensor, Accelerometer, GSM, Raspberry Pi, IoT cloud, MQTT protocol.

1. Introduction

A landslide is movement of a mass of rock, debris, or earth down a slope. In monsoons the rain water percolates and develops hydraulic pressure which exceeds the elastic limit of the soil or rocks. Due to this the strain gets accumulated which forces the soil and rocks to loosen their adhesive strengths entailing landslides [1]. Landslides can also be said of "Mass Wasting", which refers to any down slope movement of soil and rock due to gravity. It causes property damage, injury and death. Also, it adversely affects a variety of resources such as

Water supplies, fisheries, dams and roadways for years after a slide event. The landslides occur when the slope changes from a stable to an unstable condition. This change in the stability of a slope can be caused by many factors together or alone. The natural causes, such as, ground water pressure acting to destabilize the slope, erosion at the bottom of a slope by rivers

or ocean waves, earthquakes adding loads to barely stable slope, earthquake caused liquefaction destabilizing slopes. The manmade causes such as, deforestation and construction which destabilizes the already fragile slopes, vibrations from machinery or traffic. Landslides occur in rocky mountainous regions like Himalayas, konkan railways [2], Ionavala Ghats and marshy regions of Kerala in India. Landslides are hazards all over the world. Hillsides with steep slopes are prone to landslides. In the last few years Kerala also faced the loss of human landslide. Mainly landslide season in Kerala starts with the onset of the south-west monsoon every year. Landslides include debris flows, rock slides and mud slips. Apart from claiming human lives it destroys hills and vast tracts of agricultural lands, buildings, roads, economic and infrastructure.

Researchers are still doing different case studies on landslide prediction, detection and monitoring. Landslide detection can be done by using diverse methods like visual inspection using image processing [3], digital aerial photographs [4], and laser projector [5], using statistical methods. Landslide detection can also be based on data driven approaches using wireless sensor networks (WSN) [6]. The main objective to study the landslide detection is to prevent the natural calamity by detecting its early movement and this will reduce or save the human loss caused by the landslide. Also, the objective is to find a certain way in which the sensing elements should respond quickly to rapid changes of data and send this sensed data to data analysis center. The proposed Internet of things (IoT) based landslide detection and monitoring system is a low cost, robust and delay efficient.

2. System Architecture

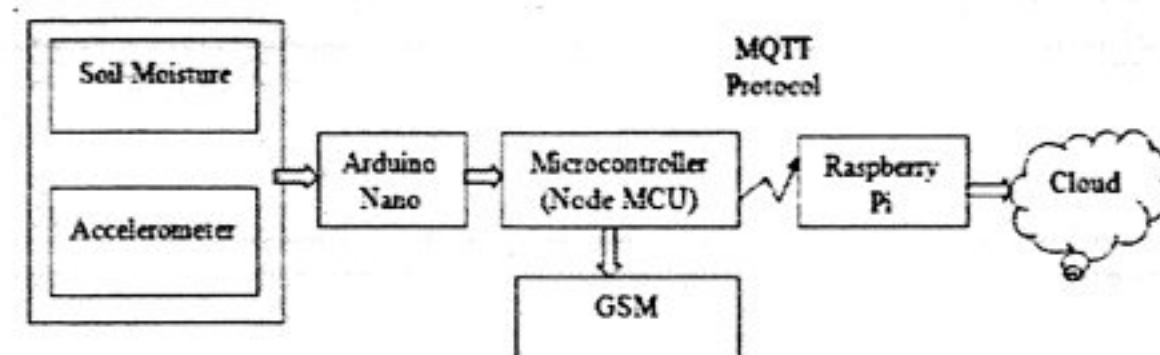


Fig. 1. Block Diagram

Fig. 1. shows the basic architecture of the system. It shows


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Virtual Personal Assistants Using Multi Dialogue Model

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Abstract: Authors mainly used multi dialogue model which uses voice and hand-gestures as input, In-order to develop a software known as "Virtual Personal Assistant Using Multi Dialogue Model". This will increase the communication and interaction between users and computers.

Keywords: ASR model, Cloud servers, Graph model, Inference engine, Input model, Interaction model, Output model, User model.

1. Introduction

Many Techniques can be used in-order design the Virtual Assistants which purely depends on the complexity of the program and its applications in daily life.

So we introduce a new approach used to develop a virtual personal assistant for future. Mainly increases the communication between human beings and Computers by multi-dialogue systems which includes gesture recognition and voice recognition.

These Dialogue Systems can be used in many fields in education, health, business etc.

2. Scheme

The technique that has been going to design the Virtual Personal Assistant using Multi Dialogue Model, will increases the communication between system users and the machines by using the voice and gesture also known as multi model dialogue system with techniques include hand-gesture recognition and speech recognition.

Also, the technique can be used in education field.

Some methods make this paper a different one.

Gesture is used in laptop or in computer with a need of window 10 specification, 64-bit chip.

Voice can be used in mobile phones with an application known as bluetooth voice can be downloaded from play-store.

3. Block Diagram

A. Module Diagram of Voice and Gesture Recognition

Virtual Personal Assistant using multi dialogue model play

an important role such that through modules there is a clear idea about the project. Modules are the smaller part of a proposed system.

Here there are mainly five modules which together make the complete working of the proposed system. The different module used here are the following.

1. Input module
2. Processor module
3. Hardware module
4. Controller module
5. Output module
6. Interface module

B. Procedures for Voice

Steps to be followed

1. Voice Acquisition
2. Speech Identification
3. Command Recognition
4. Classification and converted into as text
5. Output

C. Procedure for Gesture

Steps to be followed

1. Image Frame Acquisition
2. Hand Segmentation
3. Hand Tracking
4. Feature Extraction
5. Classification
6. Output Gesture

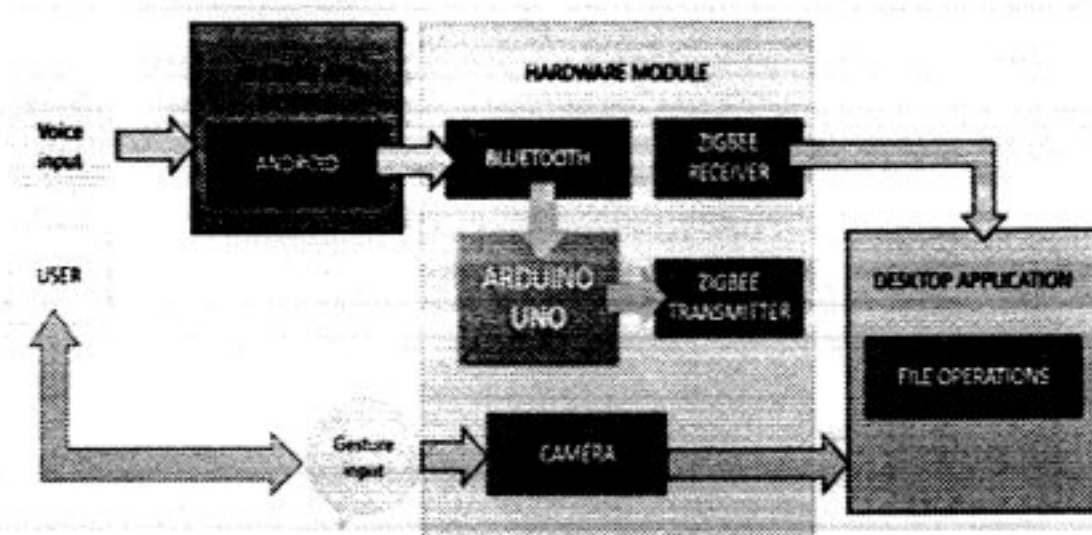
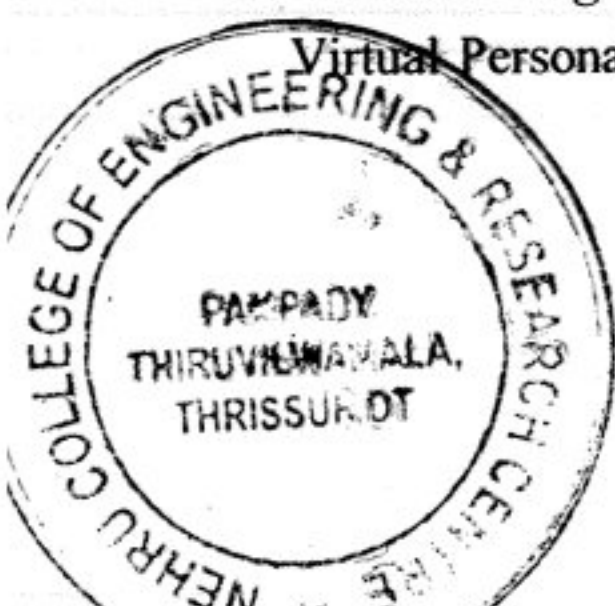


Fig. 1. Block diagram of gesture and voice recognition

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M-Health Remotely Located Patient Monitoring System

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Abstract- Automated healthcare system is the need and future of healthcare in India. The challenges in implementation of healthcare systems in developing country like India are technology, infrastructure, trained doctors and connectivity among all stakeholders. Due the rapid growth in population providing the healthcare services is becoming difficult day by day specially in rural areas. The remotely located patients are the patients away from doctor but needs his constant monitoring and support. Such as patients in ICU, at home or may be at distant places. The problems also lies in updating doctors of the monitoring parameters and the history of patients time to time. This paper presents the implementation of automated IoT based healthcare system for remotely located patients which helps doctors and guide them accordingly. The system provides alerts by the means of notifications in case of abnormal conditions observed in the monitoring parameters of the patient. It also takes care of supporting the decision making of severity of health conditions. An example of remote patient monitoring is taken for demonstration of the implemented system. The implemented system is successful to provide an interface among doctors, the nurses in hospitals and the relatives of the patient.

Keywords- AD8232 ECG sensor, LM35 temperature sensor, Pulse rate sensor, Real-time patient analysis, Real-time database.

I. INTRODUCTION

The population of nation is exponentially increasing. The healthcare system constitutes of healthcare resources and people. Based on various demands of each person the healthcare system provide different services regarding healthcare. Currently medical expertise having massive knowledge of regarding treatments, analysis and diagnosis of diseases due to marvelous innovation and researches occur in the medical field. There is more need to give attention for elder people because senior population growing constantly.

The current healthcare systems placed in hospital premises give essential focus on treatment after disease diagnosis. The treatment cost and negative effect of

medication increases because preventive healthcare services absence in hospitals. The increasing population causes challenges to existing healthcare systems. In this challenging era the major problem of death is heart disease due to stress problem and also patients don't get healthcare services on time. People don't get time for healthcare because they are busier in their career making. There is need to continuously monitor elder people living independently by reason of single family lifestyle. For getting systematic and proper health services on time is possible with real time health monitoring of person remotely.

The advancements in digital technologies increasing day by day. The wireless and mobile communication technologies possesses advantages alike availability, flexibility, high speed, reduce cost of wiring and simple use of technologies. The system generate alerts if result of data analysis is serious health issue of patient health. After surveying existing healthcare systems with drawbacks and benefits of emerging technologies we are going to propose an automated IoT based healthcare system for remote patient, doctors and caretakers remotely for patient.

II. PROPOSED SYSTEM

In project, modules play an important role such that through modules everyone get a clear idea about the project. The project is divided into different modules based on their purpose. Here the modules are mainly divided into three. They are:

- Patient Module
- Caretaker Module
- Doctor Module

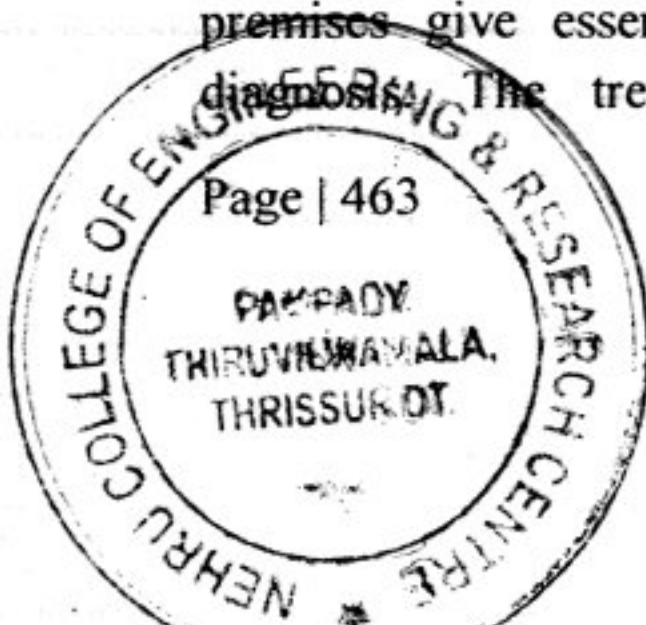
A. Patient Module

The Patient details are entered initially which include patient name, age, location and caretaker details. Based on the details given patients are given a unique patient id in order to identify each one separately. The hardware components such as different sensors which includes Temperature, Blood pressure, ECG sensors modules are connected to the patient's

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Barcode Pursuing Robot

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Abstract: Robotics and robots are getting more indulged into human day-to-day life it's important that they are correctly used and maintained properly according to the needs and the tasks they are assigned for. Main goal of the robot is to follow human by using computer vision and image processing. Human pursuing is traditionally carried out using line follower robot but here the barcode does the job way efficiently and accurately. Barcode is pasted at the back of user. The robot looks for the barcode and when it is found it moves in the direction to which the barcode moves. Here OpenCV library and programming with python is used for image processing. Arduino is used to control motors of the robot. An ultrasonic sensor is used to avoid the obstacles in front of it and the user is notified or alerted to their cellphone if the robot lost its track or finds an obstacle in front of it by using a Bluetooth module. The system also puts forward an application of carrying luggage in busy areas or shopping malls.

Keywords: Arduino Uno, Image processing, L293D, OpenCV, Ultrasonic sensor, Zigbee.

1. Introduction

The introduction of robotics and its application made human activities easier and more comfortable. Different sensors made robots to think themselves which reduces the human effort in many areas. The robot is based on barcode detection. The barcode is pasted at the backside of the user and this barcode is detected and followed by the robot. The proposed system works efficiently starting from the camera that has been attached on the robot that detects the barcode and sends it for verification through image processing. Once it's verified the communication system commands the L293 board to rotate the motors accordingly. An Ultra sonic sensor is also used to detect the objects in front of it. If an object is found the communication module is alerted and the person gets a heads-up notification on their smartphone. The person is also alerted if the barcode is way too far for real time detection. The features like real time image processing makes it well efficient from the existing systems. Barcodes are unique, secured, and easy to detect. Barcode detection clearly stands out from the traditional and existing systems like line followers, LED detection or Body detection. Line followers had the main disadvantage of following the certain path that it was destined to but with the introduction of barcodes the robot can move everywhere as long as it has the barcode in front of it. This type of systems can be

fairly introduced into trolleys at shopping malls, airports and railway stations where the robot follows the person carrying the luggage. Image processing is the part that makes the robot detect the barcode accurately. OpenCV library and programming with python is used for image processing. Along with the barcodes introducing QR codes improves the accuracy which is a next level application. Bluetooth technologies are used to establish a communication between the robot and the person and is also notified and updated from time to time.

2. Block diagram

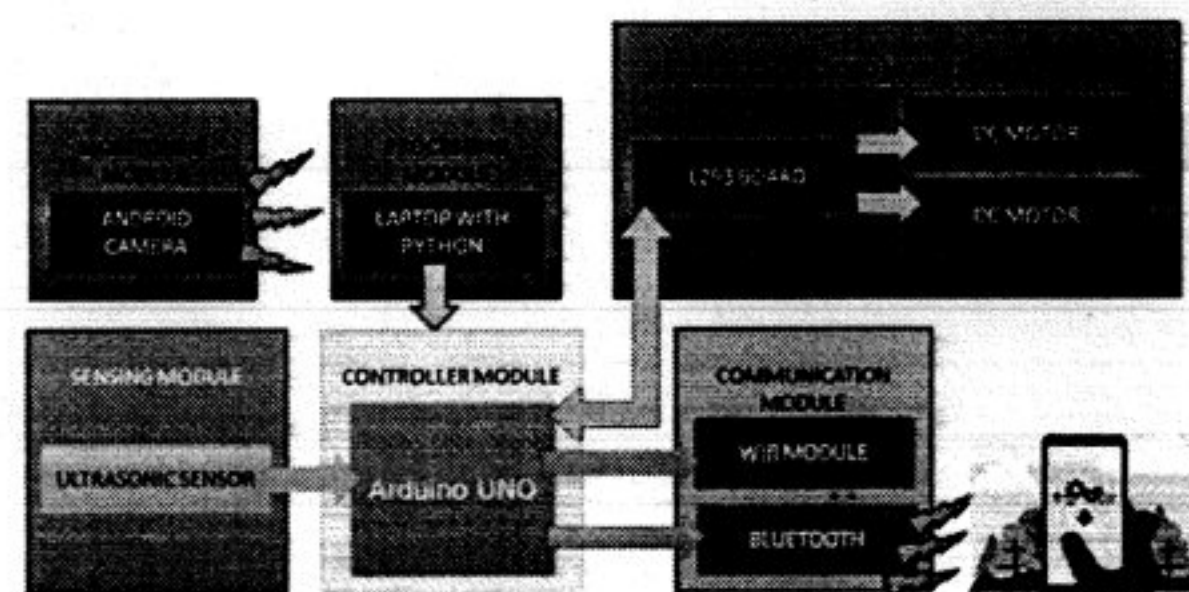


Fig. 1. Block diagram of Robot

The project is developed to follow human. A barcode is pasted at the backside of the user and when the robot detects the barcode the robot will follow it. This system can be used for carrying luggage in busy areas like railway station, airport, shopping malls.

3. Hardware Description

A. Arduino Uno

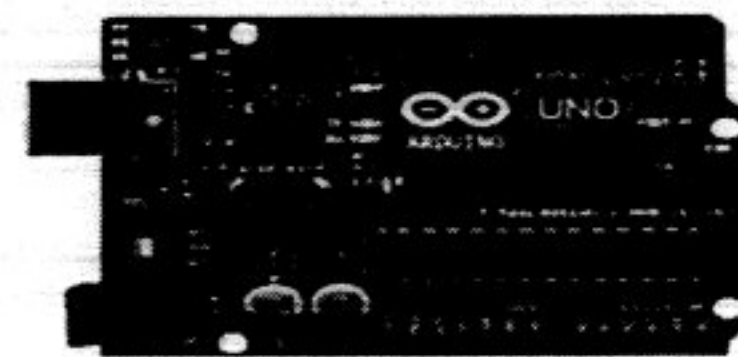


Fig. 2. Arduino Uno

The Arduino Uno board is a single-board microcontroller. It


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Lung Cancer Identification and Prediction Based on VGG Architecture

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Abstract: Lung Cancer – the most fatal disease in human beings is the uncontrolled growth of abnormal cells in one or both the lungs. Lung Cancer is the leading cause of cancer death worldwide. People who smoke has the highest risk of cancer. It can also occur in people who have never even smoked too. The motive of this paper is to identify the probability and predict the possibility of cancerous and non-cancerous lung cancer. A deep learning approach – which has multilayered structure is applied for accurately identifying lung cancer. Deep Learning approaches focuses on Convolutional Neural Network(CNN) in order to identify cancer cells. CNN is a class of deep neural networks most commonly it is applied in order to analyze visual images VGG i.e. Visual Geometry Group based architecture with 16 layers is used for accurate identification also a computerized tomography images is used to classify the lung nodule and provides vital information about its severity.

Keywords: Lung cancer, Deep learning, VGG architecture, Image classification.

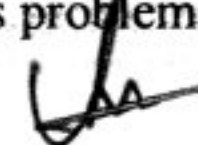
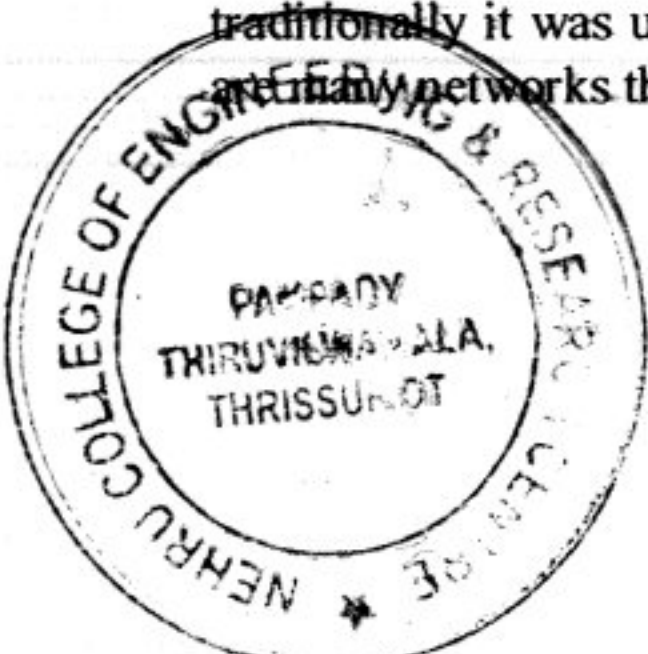
1. Introduction

The subsets of Artificial Intelligence(AI) are machine learning and deep learning. Deep learning models are trained in such a way that they behave like humans. Deep learning is an important feature in data science where the predictive analysis is being done. In machine learning process relevant data sets is being identified and once it is done the machine learning algorithm is being selected and the model is being trained.

First it is trained with the test data and then trained according to the chosen algorithm. Once the model is trained the corresponding findings and result is done. Deep learning models automatically perform the classification tasks. They are also called as deep neural networks as they make use of neural networks. Neural networks are nothing but hidden layers in the network. Without any manual external feature they directly retrieve the data once it is feeded inside the hidden layers. Now the neural networks are more than 150 layers whereas traditionally it was upto 2-3 layers. In the hidden layers there are many networks that are interconnected together.

Traditionally machine learning is a supervised learning process which feeds the information which the user wants and then specifies the corresponding results according to the feeded information and thus the process is called as feature extraction where the features are extracted according the given information but whereas deep learning builds itself without supervision. Here first in deep learning a set of images are trained as set as test data then a predictive model is being developed and trains the test data for the predictive model. In order to achieve an accuracy for deep learning models the number of training data must be in huge amount. As the immense amount of training data set increases which results in the increased accuracy rate.

There supervised and unsupervised learning. In supervised learning, the machines are trained using data with well labeled whereas for unsupervised learning we need not to supervise the model. In supervised learning the data are collected or produce output with the previous experience whereas for unsupervised learning all specific patterns are found. In supervised learning models both the input and output is given and with the help of it the corresponding output is produced whereas for unsupervised learning only input is given and the corresponding output is produced. Regression and classification are two types of supervised learning whereas clustering and association are two types of unsupervised learning. In supervised learning for input data the algorithms used are trained with well labeled. It is a simpler method and uses training data to learn a link between input and output. The number of classes are known. The result of accuracy is highly accurate and trustworthy. For unsupervised learning, the data input is against the use of labeled for algorithms. It is computationally complex and does not use output data Here the number of classes is not known and the results of accuracy are less accurate and trustworthy method. The major difference between deep learning and machine learning is that problem solving approach. In deep learning techniques problems are solved end to end whereas for machine learning techniques problems are divided in parts and



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Automobile Black Box for Accident Analysis

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Abstract: Automobiles and computing technologies a brand-new level of information services in vehicles. The automobile black box works similar to an Airplane black box. It is used to analyze the cause of vehicular accidents. Design of the black box is based on Arduino uno using GPS and different sensors. The design provides information related to vehicle speed and position on real time basis and status about temperature of engine, obstacle detection and alcohol detection and many other vehicle parameters. The system uses camera and Global Positioning System (GPS) to collect video and location of the vehicle respectively. The system helps to identify the reason for cause of accident. In addition, the system sends an alert message to emergency, head office and relatives via Short Message Service (SMS) in the case of occurrence of an accident. The automobile black box helps to analyze the accident easily and to settle many disputes related to car accident such as investigation, vehicle maintenance, insurance settlement, crash litigation, driver performance.

Keywords: Black Box, GPS, Arduino Uno, Sensors.

1. Introduction

According to the World Health Organization (WHO), more than a million people in the world are losing their life each year because of transportation-related accidents. To address this problem automobile black box takes on the role of the investigator to determine the cause, thereby helping to propose measures to protect lives. The system also assists the insurance companies with their claim settlements. The black box is defined as an electronic device, which is used to record and store information in particular. The automobile black box is a device used to record the information's such as engine temperature, presence of obstacle, alcohol content and exact location of the accident about the vehicle. Automobile Black Box detects a crash automatically, and also records the motion of the vehicle and driver's actions. It consists of data collection devices for collecting the information about car's status and the driver's actions. Apart from the accident analysis by objectively tracking what occurs in vehicles, the automobile black box sends short message indicating the crash, position of vehicle and recorded details to traffic headquarters while emergency medical service receive message about crash of vehicle and its location so that first aid can be provided as early as possible. It also sends a short message to family members indicating crash and the position of vehicle. The system also alarms the driver

according to the readings of alcohol sensor, ultrasonic sensor and seat belt sensor.

2. Block diagram

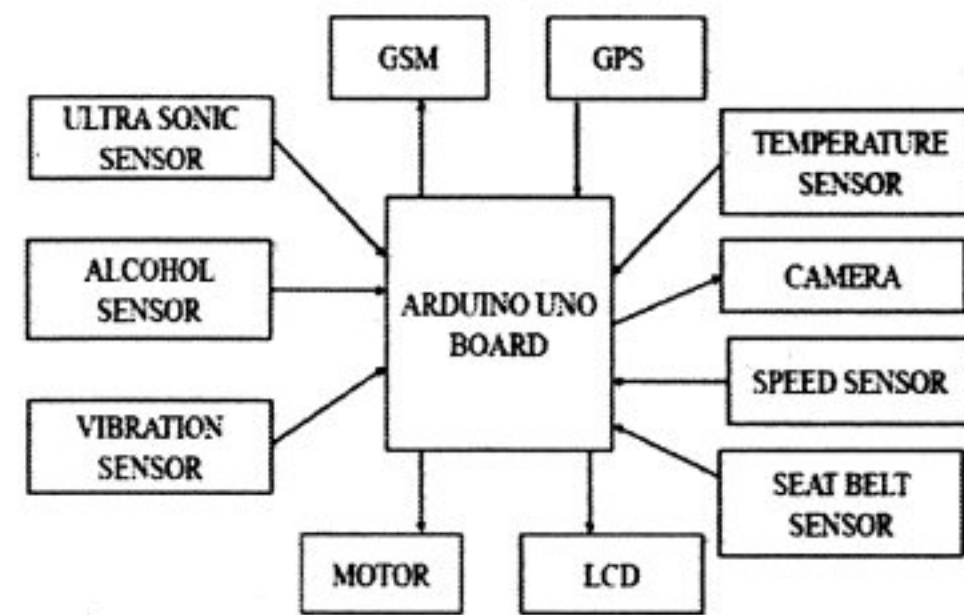


Fig. 1. Block diagram of automobile black box system

The project is developed to record informational data, such as: speed of car, temperature of engine, alcohol consumption of driver etc. to revolutionize the field of motor vehicle accidents investigation. It can also use for vehicle mapping and accident alert with the help of GPS and GMS technology.

3. Hardware description

A. Arduino uno

The Arduino Uno board is a microcontroller based on the ATmega328. It has 14 digital input/output pins in which 6 can be used as PWM outputs, a 16 MHz ceramic resonator, an ICSP header, a USB connection, 6 analog inputs, a power jack and a reset button. This contains all the required support needed for microcontroller. The program is directly loaded to the microcontroller. Arduino integrated development is used for programming.

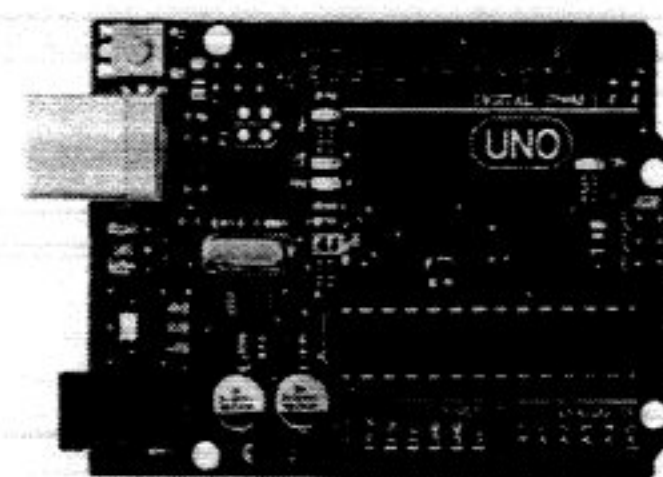


Fig. 2. Arduino Uno

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HAND GESTURE CONTROLLED SURVEILLANCE CAR

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Abstract: Hand Gesture Controlled Surveillance Car is a robotic car which can be controlled by simple human gestures. The user needs to wear a gloves which has an accelerometer that will record the movement of hand in a specific direction which will result in the motion of the robot in the respective directions. The robotic car and the gloves are connected using a wireless medium. The hand gesture will replace the remote control that is generally used to move a robotic car. The user can move the car in forward, backward, left and right directions and to stop it. The robotic car can move smoothly and sharply around any turns due to the mechanism it uses. The device will have a camera attached to it which will help in surveillance and other operations where practical human access is not possible. An arduino will be used to connect the components and other sensors will do the respective operations for the control of the device and to perform the specified functions.

Keywords: Accelerometer, Microcontroller Arduino, RF Transmitter, RF Camera

1. Introduction

The most regular thing that people do when frustrated with devices is perform hand gestures to try to demonstrate the device what they want it to do. A controller is unnatural and requires getting used to; body language and hand gesture, however, are instinctual. The gesture recognizing glove utilizes various sensors to capture those hand gestures and deduce them as inputs. A touch of the thumb, a jiggle of the finger, or a tilting of the hand all act as control inputs. Though the change may seem rather daunting, it has to start somewhere, and that's where the Glove comes in, one of the first steps towards superior human-machine integration[1]. Glove aims to link the gap between the user and traditional physical hardware devices. Glove will provide a tangible interface that relies on hand gestures to wireless control of any device or software.

The goal is to capture simple hand gestures from the Glove and use that input to wireless control a modified RC car[5]. With the rapid development of embedded technology, a variety of embedded video surveillance products are widely used in production and life. At present, video surveillance system in security, military, industrial, agricultural and other fields more and more widely used. With the development of computer technology and embedded technology, the digital network and intelligence of video surveillance have become the trend of video surveillance technology. Users have put forward higher requirements on video surveillance, such as monitoring anywhere, anytime, and seeing clear and smooth[3]. On the other hand, robots including unmanned vehicles are also the hotspot of current research. Multiple variables are controlled simultaneously as Glove outputs a constant control signal[2]. The secondary goal is to reach a level of comfort and precision with Glove currently held by present day controllers. This is an important goal to achieve because if Glove cannot perform at least as well as current controllers, it will be ignored as people will errand the more competent option.

2. Objective

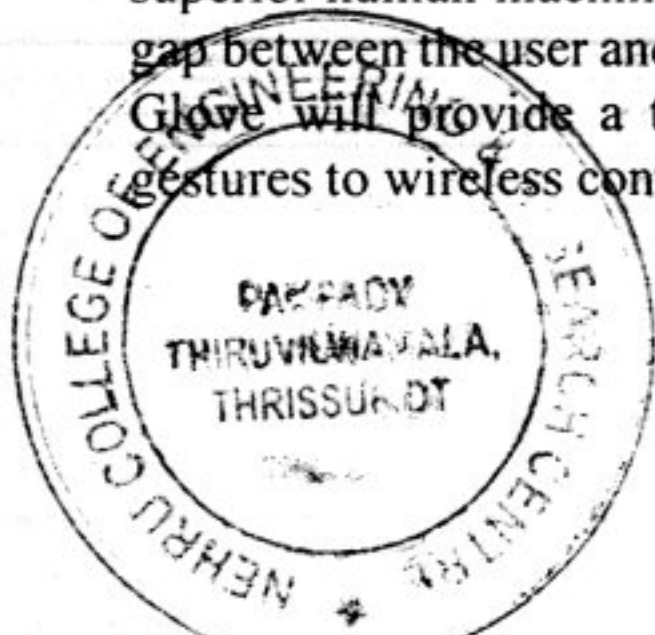
The objective is to build a surveillance car which is controlled using hand gestures. The remote controlled car must be easy to control. It should intake the signals that the user gives and should make movements accordingly. It must have a user friendly and attractive interface. It should be feasible to all by all means. It should not be expensive and should not use expensive components in the making. The surveillance visuals must be transferred quickly without any data loss. The transmission distance should also be very wide so as it can cover a lot of distance. The programming concept that is used must be simple and easy to understand so that anyone can adjust for any required changes. The remote control car must be designed in such a way that the vehicle does not slip, slide or turnover and should always move in a constant speed and rate of movement.

3. Proposed System

The system is divided into two parts to make the task easy and simple to avoid complexity and make it error free. First, the transmitting section and second is receiver section. The

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Heart Disease Prediction Using Machine Learning Algorithms

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Abstract: Healthcare is an important task to be performed in human life. CVD is the category to which the diseases affecting the heart and blood vessels are included. The methods used before for forecasting the CVD helped in reducing the risks in high risk patients. The health care industry contains lots of medical data, so machine learning algorithms are made use to efficiently predict the heart diseases decisions. We classify the attributes for prediction and decision making at different levels. The performance is based on classification, accuracy, sensitivity. This project proposes a Machine learning model to predict whether a person has a chance of suffering from any CVD or not and to provide an awareness and diagnosis. This is done by applying algorithms of machine learning for classification and prediction. Some of the algorithms we are using here are-K-NN (Nearest Neighbor), Support Vector Machine(SVM), Random forest.

Keywords: Machine Learning, SVM, K-NN, Random Forest.

1. Introduction

According to the World Health Organization (WHO), an estimated 17 million people die each year from cardiovascular disease, particularly heart attacks and strokes. It has hence become an important task to record the most common and major symptoms and health habits that can lead to CVD. Various tests are performed prior to diagnosis of CVD, including auscultation, ECG, blood pressure, cholesterol and blood sugar. These tests are often long and long when a patient's condition may be critical and he or she must start taking medication immediately, so it becomes important to prioritize the tests. Several health habits contribute to CVD. Therefore, it is imperative to know what kind of health practices lead to CVD. Due to the increasing amount of data, machine learning is widely used in order to control the data. Machine learning helps in retrieving knowledge from a huge amount of data that might be difficult for a human being to control and manage. The project uses the machine learning algorithm to check the chance for a person to have a heart disease using the data stored about the patient. This project can be used in clinics to classify if a person has a heart disease or not based on the learned model and then this result can be used by the cardiologists for further diagnosis.

2. Implementation

A. Data Source

The dataset used here for predicting heart disease is taken from a Machine learning repository. The dataset used here is real dataset. The dataset consists of 720 instances of data with the appropriate 13 clinical parameters. The clinical parameters for the Dataset is based on the tests that are conducted related to the heart like BP level, cp type ECG, etc. Machine learning methods learn from examples. It is important to have good grasp of input data and the various terminology used when describing data. Datasets are rows and columns, like a database table or an Excel spreadsheet.

B. Dividing the Dataset

We divided the dataset to training data and testing data. A training dataset consists of examples used for learning, that is to fit the features (e.g., weights)of, for example, a classifier. Most approaches that search through training data for empirical relationships tend to over-fit the data, meaning that they can identify and exploit apparent relationships in the training data that do not hold in general.

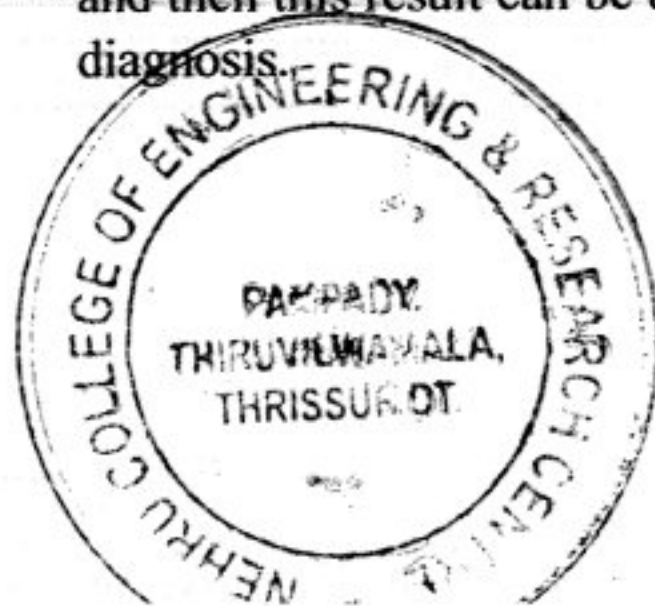
A testing dataset has similar probability distribution as that of the training dataset but does not depend on it. If a model that has been trained using a training dataset gives accurate results for the test dataset, it is said that minimal over fitting has taken place.

C. The algorithms used

The algorithms used in this system are Support Vector Machine (SVM), K-Nearest Neighbour (KNN) and Random Forest (RF).

1) Support Vector Machine (SVM)

Support Vector Machine is an algorithm which is used in machine learning for classification and regression techniques. It is regularly used as the classification techniques due to its efficiency when compared with the other algorithms. This technique plots a hyper-plane for every attribute as a co-ordinate that is present in the dataset. Classification is performed by identifying the hyper-plane that divides one class



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RFID based POS System

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Abstract - An innovative product with societal acceptance is the one that aids the comfort, convenience and efficiency in everyday life. There are number of supermarkets in each city having a huge amount of people visiting on a daily basis. Now a days purchasing and shopping at big malls is becoming a daily activity in metro cities. It is seen that there is a huge rush at malls on holidays and weekends. The rush is even more when there are special offers and discount. The payment of bill by standing in long queue is a tedious factor. The existing system is the Barcode technology in which the barcode must be in the direct line of sight to be read by barcode scanner. Barcode have no read/write capabilities and can be easily reproduced, which results in less security. If the barcode is ripped, damaged there's no way to scan the product. To overcome this, the proposed system uses radio frequency identification technology that has gained position in various innovative applications that also results in the speed of handling manufactured goods and materials. RFID can detect the tags using RFID reader from distance without the line of sight. It allows contact less detection of the objects using the radio frequency and supports the read/write memory capability and it can hold large amount of data under a unique identifier. Using the RFID technology the time of people in queues will be reduced to 1/3rd of the total time taken to stand in the queues. People can place all their products on the plain area where an RFID reader will be placed which will be scanning all the items having RFID tags simultaneously and automatically updates the details of each item into the computer. Thus, a single person is enough at the billing section just to print out the bill and hand it over to the customer other than having three people at each counter. Thus, reduces the overall waiting time of the customers and enable a better shopping environment for the customers.

Key Words: RFID, POS, UHF, GUI, IDE

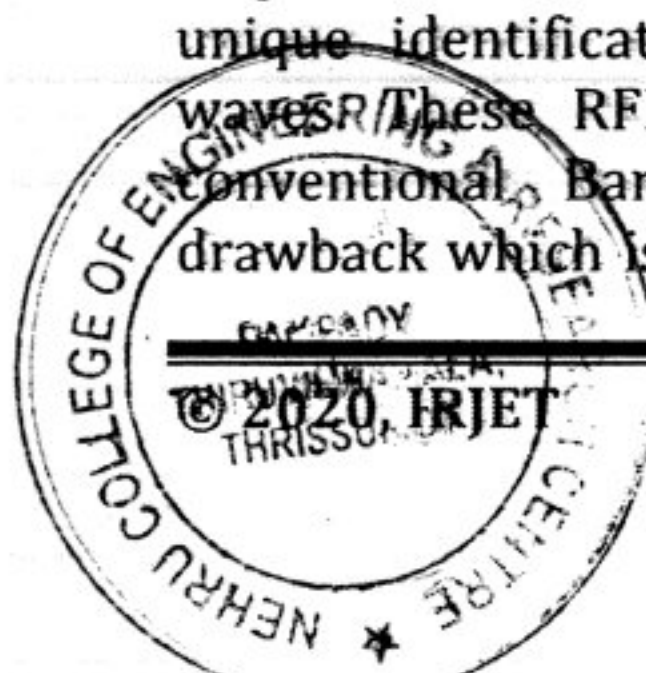
1. INTRODUCTION

These days, RFID's are widespread and taking role in many advanced projects due to its fast and effective response. RFID are generally tags that are used for unique identification of products by using radio waves. These RFID's offer more advantages over conventional Barcodes as they have a major drawback which is Line of sight technology and also

these barcode tags have constraints in its durability whereas the RFID's tags are more durable and able to read/write data which could even be encrypted. These tags could hold plenty of data like products name, price, size, weight and other information using their identification number. By implementing this RFID technology for unique representation of each product in a market shopping is done more easily. RFID (Radio Frequency Identification) technology provides ability to many new services and quality in the busy environment. The paper discuss about the RFID implementation system used for bulk billing at malls or markets. This will enable the consumers satisfaction, reducing time requirement for payment and also the manpower required at markets or malls by instantly payoff their entire purchase upon arrival at the payment counter, increasing customer. These RFID tags are utilized to automate the checkout process by building a system that could read the RFID signals of all the objects that would be placed in proximity to an antenna platform. This eliminates the need for barcode scanning of each individual item, making checkout a significantly faster experience. The tags are little in size and so it can be easily pasted on products RFID tags are an improvement over barcodes since you can update or change the information on the tag. Since it communicates with the network, it can take the data stored on it change it to something new. The network connected to the reader can update or change the data stored on the RFID tag if necessary.

1.1 PROBLEM FORMULATION

The use of barcodes in the retail industry all started back in the late 1940's and early 1950's to figure out a way to acquire product information when a customer checked out groceries. Barcodes became commercially successful when they were used to automate supermarket checkout systems, a task for which they have become almost universal. Their use has spread to many other tasks that are generically referred to as automatic identification and data capture (AIDC). In stores, barcodes are pre-printed on most items other than fresh produce from a grocery store. This speeds up processing at check-



Analyzing Sentiments in Twitter Using Machine Learning

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Abstract: Twitter stands not only as a social media but also to easily understand and categorize, reveal customers' needs, mindsets and gather information regarding any campaign or interests. Analyzing the sentiments of tweets help us to study the polarity of thoughts of certain people or product. Through this obtained data, any tweets posted by a user in twitter can be indicated using its polarity like positive, negative and unbiased tweets. This enhanced sentimental analysis of twitter has retrieved the data based on an inception and performs using Text Blob. The proposed system is to examine the pre-stored data by real-time analysis via Twitter API. As a result, it helps to look over the posts with better accuracy using machine learning.

Keywords: Text Blob (library for processing textual data), Data mining, Micro blogging.

1. Introduction

Twitter, a much popular social media which connects people, thereby giving their opinions on different trending topics. At present times, people are exposing their social and private life through social media using tweets, reviews, hashtags comments, posts and emojis.

[2] This application has been developed as a significant smaller scale blogging site, having more than 100 million clients producing more than 500 million tweets per day [1]. Twitter clients are permitted to impart their insights as tweets, utilizing just 140 characters. This prompts individuals to compact their announcements by utilizing slang shortenings, emojis, short structures and so forth.

Moreover, this platform is also being used as a marketing strategy by businesses to connect with their customers. Mainly, this marketing strategy is to learn more about the customers, to make buzz about the new product, to obtain a very fast customer review and mostly to brand a much more human, Twitter gets us to covered on all these.

We explore the method for building such data using Twitter hashtags (e.g, #CoronaVirus, #Stayhome, #socializing) to identify positive, negative, and neutral tweets to use for training three-way sentiment classifiers. Thus, these tweets and the hashtags are must for analyzing the thinking level of individual people.

The Classifier will classify the tweets according the training set and regulates the polarity of the tweet as the output. The test data is basically the real-time tweets from twitter accessed using Twitter API. In this paper, we are going to analysis the microblog called as Twitter, classify the "tweets" into positive, negative and neutral sentiment.

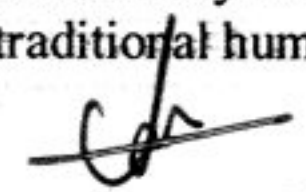
2. Literature Survey

As the number of transactions in E-market places is growing drastically, more and more product information and reviews are available on the Internet. [3] Since costumers wants to purchase good products, reviews became most salient information. But due to massive quantity of reviews, customers can't consider all reviews. In order to resolve this issue, a lot of research is being conducted in Opining Mining. Through Opinion mining, contents of whole product reviews will be made available. Nowadays computational statistics are applied to handle massive volume of reviews. A method for summarization of product reviews using the user's opinion, feature occurrences and the rate of review in order to improve the performance of existing methods was proposed by Jung-Yeon Yang, Jaeseok Myung and Sang-goo-Lee. Through this method, enormous amount of reviews can be handled in a short span of time efficiently.

[4] Blog texts are classified according to the mood reported by its author during the writing. The data consists of a huge collection of blog posts – online diary entries – which include an indicator of the writer's mood. A system that Experiments with Mood Classification in Blog Posts by proposed by G Mishne.

The main finding was that mood classification was a demanding task using current text analysis methods. A diversity of features for the classification process was being used, which included content and non-content features, and some features which were distinctive to online text such as blogs. The results show a small, consistent, improvement over a naive baseline; while the success rates were relatively low, human performance on this task was not substantially better. So, this method was proved better than the traditional human performance.




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Probability Based Student Performance Prediction Using Naïve Bayesian Algorithm

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Department, NCERC, Kerala

Abstract: Probability based Educational data processing was one among rising field that include technique of observed students' particulars by completely dissimilar shares like earlier semester marks, attendance, assignment, discussion, workplace work was of accustomed improved bachelor tutorial performance of scholars and overcome difficulties of low ranks of bachelor students. it had been extracted helpful data from bachelor tutorial student's information collected from department of Computing. after pre-processing information, that was applied data processing technique to get classification and agglomeration. during this study, classification technique was delineated that was supported naïve byes algorithmic program and used for tutorial data processing. it had been accessory to students beside to lecturers for analysis of educational performance. it had been cautionary technique for students to progress their performance of study.

Keywords: Educational data processing, classification technique, classification and agglomeration, naïve byes algorithm

I. Introduction

Many organization of upper education was coming upon across Asiannation. Conversely education's quality was deciding by rate of success student's and to what degree organization was in a position of preserved students. Predicting performance of student was aid recognized students United Nations agency be by chance of failure and thus management was provided timely assist and procure necessary steps to pedagogue students to improved performance. the aptitude to predict performance of student was imperative in education sector. victimization data processing technique that was information in great quantity and find out hid info sample that was cooperative in deciding. it absolutely was identification of various aspects that affected student of learning activities and performance throughout academic sector. Creation of prediction by classification data processing technique on foundations of known prognosticative keyword.

II. Existing Work

[1]. the analysis presents associate degree analysis of the factors that contribute to the tutorial performance of scholars admitted into the university. The variables of interest area unit the entry qualification and admission mode and the way these factors have an effect on the tutorial performance of the scholars.

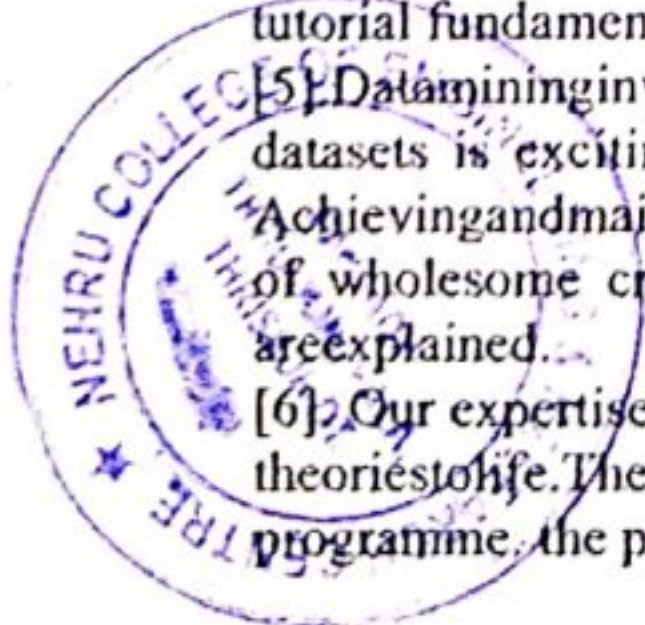
[2]. Distributed cluster operating among groups of computer code engineers is progressively evident within the "real world." Tools to support such operating are at the moment restricted to all-purpose software package involving video, audio, chat, shared whiteboards, and shared workspaces. at intervals computer code engineering education, cluster tasks have a long-time role within the information.

[3]. Lockheed Martin's C-130J Avionics/Software Integrated Product Team (IPT) creates software system that runs a good style of systems on the C-130J craft. This team develops embedded safety-critical period air vehicle software system and a ground-based information analysis system for craft analysis

[4]. Academia and trade disagree regarding what students ought to learn in class versus on the task. once the University of Alabama at Birmingham developed a graduate program in electrical and pc engineering, they consulted trade executives to develop a programme that addresses industry's wants while not compromising tutorial fundamentals.

[5]. Data mining involves the systematic analysis of enormous knowledge sets, and data processing in agricultural soil datasets is exciting and trendy analysis space. The productive capability of a soil depends on soil fertility. Achieving and maintaining acceptable levels of soil fertility, is of utmost importance if agricultural land is to stay capable of wholesome crop production. during this analysis, Steps for building a prophetic model of soil fertility are explained.

[6]. Our expertise shows that a typical industrial project will enhance package engineering analysis and produce theories on life. The University of Kentucky (UK) is within the initial section of developing a package engineering programme. The primary course, a graduate-level survey of package engineering, powerfully emphasised quality.



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THERMO MECHANICAL ANALYSIS OF ENGINE VALVE AND VALVE SEAT INSERT BY FINITE ELEMENT METHOD

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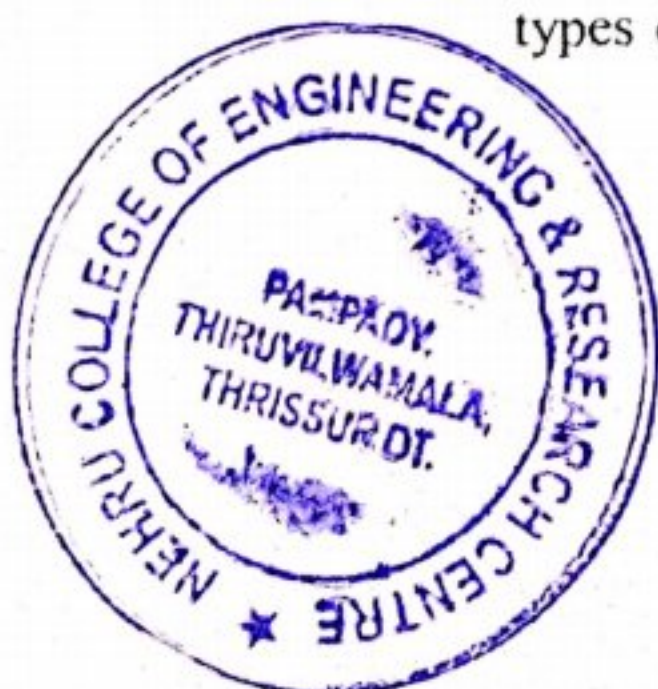
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Abstract

In this investigation deals with the stress induced in a valve due to high thermal gradient and high pressure inside the combustion chamber. To analyze the valve ANSYS has been used as the tool. A thermal and structural analysis is performed on the valve. In the first stage of analysis the temperature distribution across the valve is determined. In the second stage this temperature distribution is transferred on to another element and pressure load was applied on the valve to determine the displacement distribution in the valve. The above said process will be repeated for the different valve materials and finally the best material will be suggested for the valve based on its strength and thermal properties capability.

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Fontanesi, S, Cicalese, G, Tiberi, A, [1] introduced the concept of thermal behaviour of IC engines of high performance on direct injected of SI engine for sport car. Goli Udaya Kumar, Venkata Ramesh Mamilla [2] studied the failure of inlet and exhaust valve in different working condition failure like fatigue, high pressure inside cylinder and due to load impact. [3] Naresh Kr. Raghuvanshi, Ajay Pandey, et.al. [3] studied the failure of the intake and outlet valves by various types of failures due to thermal and mechanical effect through various research paper as review



Performance of a Compression Ignition Engine with Blends of Biodiesel (from a mixture of Spirulina Microalgae Oil and Sunflower Oil) and Diesel

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Abstract: In this paper, a high viscous micro algae oil, approximately 8 times more than that of diesel, obtained from spirulina micro algae using soxhlet apparatus was mixed with sunflower oil in three different volume percentage say 5:95 ml, 10:90ml and 15:85ml in order to decrease the viscosity by 40%. In addition, the above mixture was converted to biodiesel through two step trans-esterification process with methanol. Also, the produced 3 types of bio-diesel were mixed with pure diesel in 10:90 ml by volume percentage. Furthermore, a 5 HP single cylinder, 4 stroke, water cooled diesel engine was evaluated at constant speed with varying load by rope brake dynamometer using blends of biodiesel B10A, B10B and B10C with conventional diesel in terms of brake power, total fuel consumption, brake specific fuel consumption, brake thermal efficiency, brake specific energy consumption and volumetric efficiency. The study also includes, Physical and chemical property inspection, measurements of calorific value, PH value, flash and fire point and testing of calculated cetane index for biodiesel, blended biodiesel and pure diesel. It is inferred from the above study that the properties and performance of blended biodiesel are very close to the conventional diesel. The innovation in this paper as compared to the literature and our previously published paper is the usage of an alternative fuel to the diesel using biomass feedstock blended with Sunflower oil. Apart from, increasing the performance of a CI engine, it reduces our carbon footprint and pave a way to become a greener planet.



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PARAMETER AND MULTIPLE PERFORMANCE OPTIMIZATION OF MEDM THROUGH VARIOUS ELECTRODE FOR HEAT TREATED TOOL STEEL

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Abstract

Electric discharge machining (EDM) is a non-traditional machining processes that involved a transient spark discharges through the fluid due to the potential difference between the electrode and the work piece. In this research work is to determine the proper electrode material for machining tool steels work pieces using electrical discharge machining (EDM). Basically, improper choose of electrode material in EDM machine may result a few problems like the machine may cause of poor machining performance and it will decrease the accuracy of the products. This research work presents a fundamental study of characteristic of electrode discharge machine (EDM) that is electrode wear ratio (EWR) and material removal rate (MRR) by using different electrode materials in order to increase the understanding of EDM processes. To archive this, the characteristic of machining must be determined because the higher material removal rate (MRR) and less electrode wear ratio (EWR) will lead to better performance.

Keywords: Electric Discharge Machining (EDM), Electrode Wear Ratio (EWR) and Material Removal Rate (MRR), Performance Analysis, Optimization, DoE.

1. Introduction

Electrical discharge machine (EDM) is commonly used in tool, die and mould making industries for machining heat-treated tool steel materials. The heat-treated tool steels material falls in the difficult-to-cut material group when using conventional machining process. The high rate of tool wear is one of the main problems in electrical discharge machine (EDM). The wear ratio defined as the volume of metal lost from the tool divided by the volume of metal removed from the work material, varies with the tool and work materials used. If the rate of tool wear is high means that the material is easy to wear and not good for machining performance. A. M. Nikalji, et.al. [1]



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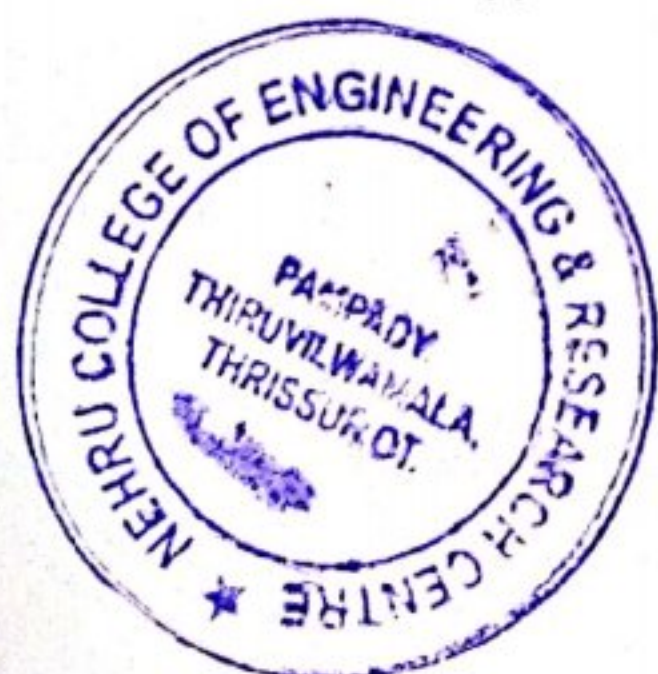
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Design Optimization of Sports Utility Vehicle Chassis

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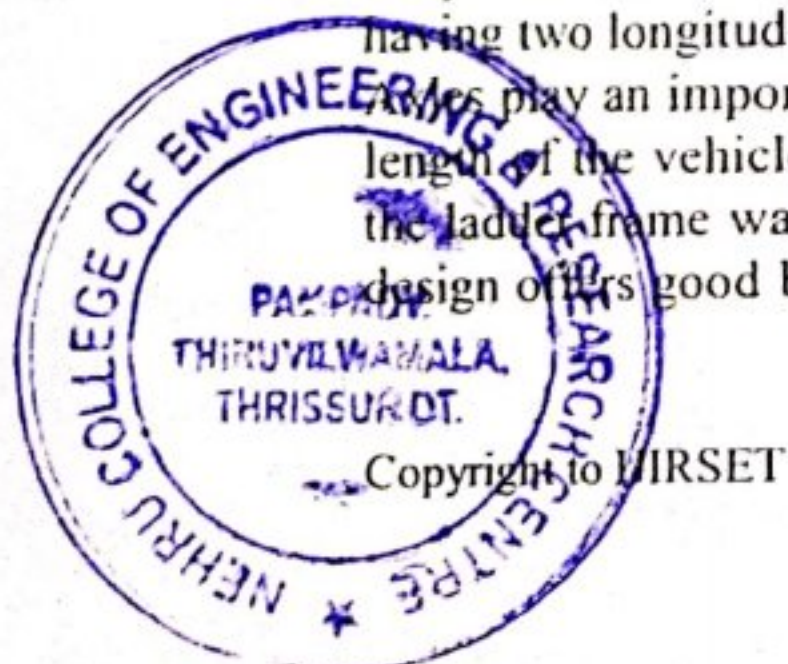
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ABSTRACT: The vehicle chassis frame is an important part of an automobile. The chassis frame is the main structure of any vehicle. In this project work chassis for a SUV was designed using SolidWorks 2016 edition and analysed using Ansys R15.0. Chassis with side members having three different cross sections such as rectangular, square and circular were analysed by applying the working load and the results were compared to select the chassis with least total deformation. Then the selected chassis was modified and was subjected to a shear force and was analysed. Then the results were compared with analysis results of the initially designed chassis. Then the chassis with least value of total deformation was selected and was applied with three different materials and the results were compared to select the most suitable material. Then the chassis model with the least value of total deformation applied with the most suitable material was analysed and results were evaluated. Then modal analysis of the optimized chassis applied with the most suitable material was performed. The analysis data was used to perform the harmonic response analysis of the chassis and different properties of the chassis were analysed. From the results it can be concluded that chassis with rectangular cross section applied with ASTM A302 alloy steel is the best choice for sports utility vehicle.

KEYWORDS: Chassis, Crossmembers, ASTM A70 steel, Carbon steel AISI 4130, ASTM A302 alloy steel.

I. INTRODUCTION

A vehicle frame is the main supporting structure of a motor vehicle to which all other components are attached, comparable to the skeleton of an organism. Chassis frame is the basic frame work of an automobile. All the automobile systems like transmission, steering, suspension, braking system etc. are attached to and supported by the chassis frame. The frames provide strength as well as flexibility to the automobile. When the vehicle travels along the road, the chassis is subjected to excitations from the engine and transmission system as well as due to the road profile. Due to these excitations, the chassis begins to vibrate. Natural frequency of vibration coincides with the frequency of external excitation, resonance occurs, which leads to excessive deflections and failure. The ladder frame is one of the simplest and oldest of all designs. This was the first type of chassis to be designed. Almost all car manufacturers used it until the early 60's. Nowadays some SUV's still use it. As the name connotes, ladder chassis resembles a shape of a ladder having two longitudinal rails inter linked by several lateral members and cross braces. It uses few, large diameter tubes. Rails play an important role in sustaining weight. It consists of two symmetrical beams, rails, or channels running the length of the vehicle, and several transverse cross-members connecting them. Originally seen on almost all vehicles, the ladder frame was gradually phased out on cars in favour of perimeter frames and unitized body construction. This design offers good beam resistance because of its continuous rails from front to rear, but poor resistance to torsion or



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Design Optimization of Planner Machine Mechanism

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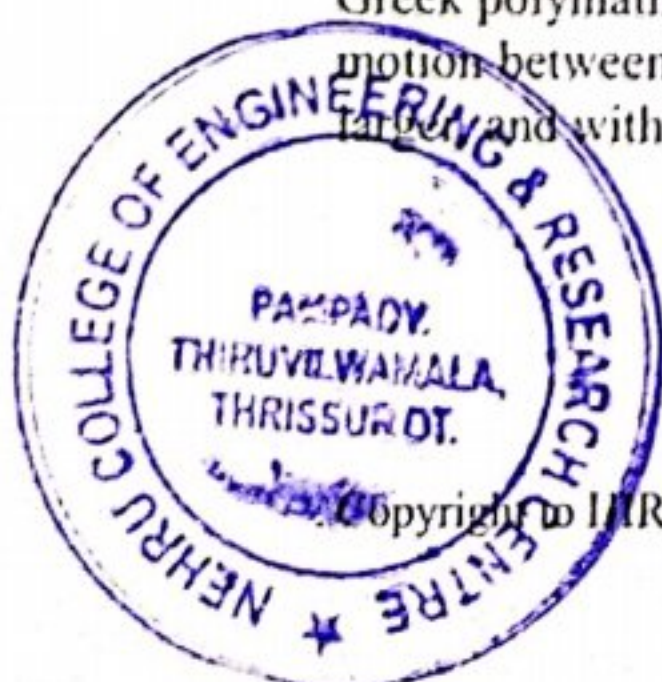
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Kerala, India⁴

ABSTRACT: A gear is a rotating machine part having teeth or cogs, which mesh with another toothed part in order to transmit torque. In this project a defect existing in a planner machine is identified and new methods were used to reduce the effects of the existing defect. In the existing planner mechanism force required for the movement of the rack and pinion mechanism of the planner is transmitted through a shaft connected to the pinion. Thus when the cutting forces reach above a particular value the tooth of the spur gear gets broken. In order to rectify this defect a new mechanism using two bevel gears placed at right angles is used to transmit forces to the pinion and both the mechanisms are compared using Ansys 17.0 to evaluate the improvements in performance. Then the material of the modified design is optimized by comparing the performances of three different materials such as Grey cast iron, Stainless steel and AISI 4140.

KEYWORDS: Planer machine, Stainless steel, Bevel gear, AISI 4140

1. INTRODUCTION

A gear is a rotating machine part having cut teeth, or cogs, which mesh with another toothed part in order to transmit torque. Two or more gears working in tandem are called a transmission and can produce a mechanical advantage through a gear ratio and thus may be considered a simple machine. Geared devices can change the speed, torque, and direction of a power source. The most common situation is for a gear to mesh with another gear; however, a gear can also mesh with a non-rotating toothed part, called a rack, thereby producing translation instead of rotation. The gears in a transmission are analogous to the wheels in a pulley. An advantage of gears is that the teeth of a gear prevent slipping. When two gears of unequal number of teeth are combined, a mechanical advantage is produced, with both the rotational speeds and the torques of the two gears differing in a simple relationship. In transmissions which offer multiple gear ratios, such as bicycles and cars, the term gear, as in first gear, refers to a gear ratio rather than an actual physical gear. The earliest known reference to gears was circa A.D. 50 by Hero of Alexandria, but they can be traced back to the Greek mechanics of the Alexandrian in the 3rd century B.C. were greatly developed by the Greek polymath Archimedes (287-212 B.C.). A planer is a type of metalworking machine tool that uses linear relative motion between the workpiece and a single-point cutting tool to cut the work piece. A planer is similar to a shaper, but with workpiece moving, whereas in a shaper the cutting tool moves.





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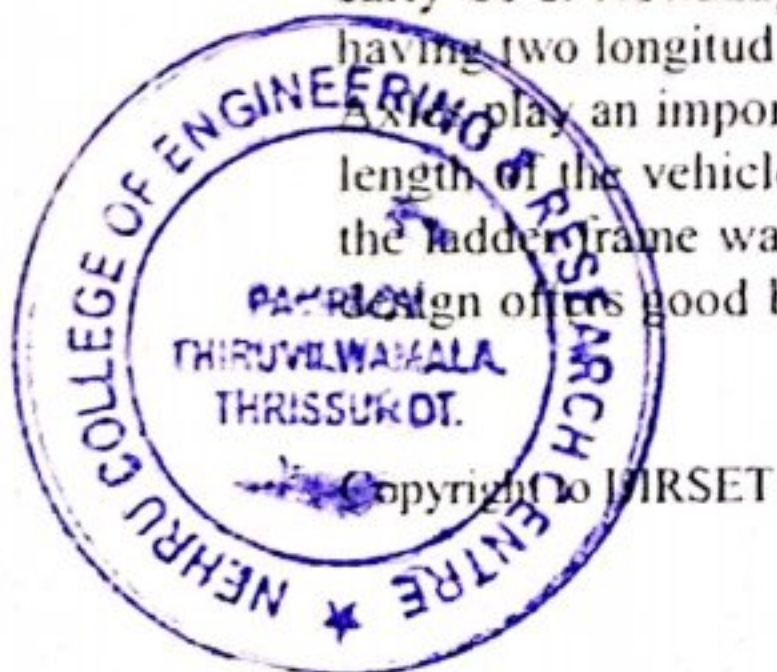
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Design Optimization of Ammonia Bullet Pressure Vessel

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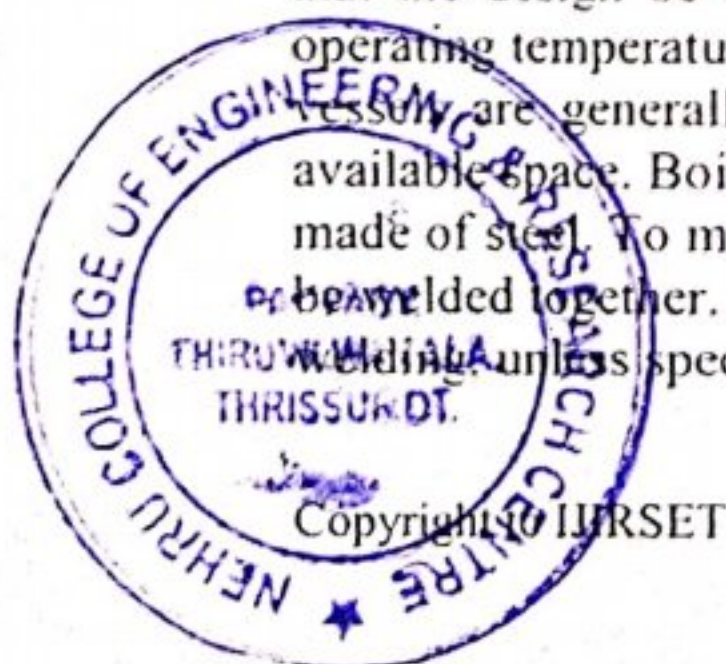
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ABSTRACT: Ammonia is the basic raw material which is widely used throughout the world for the production for fertilizers and petroleum products. In order to achieve its extensive requirement it is being imported from foreign countries. Ammonia is transported by means of waterways due to the risk involved in other means of transport. It is stored and transported in pressure vessels. Due to high toxicity involved in Ammonia it is to be handled very carefully. A pressure vessel is a container designed to hold gases or liquids at a pressure substantially different from the ambient pressure. These pressure vessel need to be safe and should withstand any external or internal impact. Pressure vessel are design according to ASME Boiler & Pressure Vessel Code, Section VIII, Division I. Here an alternative solution to withstand any accidental external impact on the pressure vessel which results in more safety is proposed. An existing design of pressure vessel is modelled in Solid Works 2016 Edition and analyzed the same in Ansys 15.0. Afterward a new model of pressure vessel which includes an internal design change where a 10 mm thickness of Silicon Rubber is installed is designed. The same is analysed with an external point load of 20KN and results are compares with the existing one. Two different materials such as SA 537 and Stainless steel 302 are analysed in order to find out the best suitable one for the shell of the pressure vessel. The compared results include static structural, modal and harmonic analysis. From the results it can be concluded that pressure vessel with silicon rubber introduced is the best choice for advanced safety in ammonia transportation.

KEYWORDS: Pressure vessel, Stainless steel 302, SA 537, Silicon rubber.

I. INTRODUCTION

Tanks, vessel and pipelines that carry, store or receive fluids are called pressure vessel. A pressure vessel is defined as a container with a pressure differential between inside and outside. The inside pressure is usually higher than the outside. The fluid inside the vessel may undergo a change in state as in the case of steam boiler or may combine with other reagent as in the case of chemical reactor. Pressure vessel often has a combination of high pressure together with high temperature and in some cases flammable fluids or highly radioactive material. Because of such hazards it is imperative that the design be such that no leakage can occur. In addition vessel has to be design carefully to cope with the operating temperature and pressure. Pressure vessels are usually spherical or cylindrical with dome end. The cylindrical vessels are generally preferred because of the present simple manufacturing problem and make better use of the available space. Boiler, heat exchanger, chemical reactor and so on, are generally cylindrical. Many pressure vessels are made of steel. To manufacture a cylindrical or spherical pressure vessel, rolled and possibly forged parts would have to be welded together. Some mechanical properties of steel, achieved by rolling or forging, could be adversely affected by welding unless special precautions are taken. In addition to adequate mechanical strength, current standards dictate the





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Design Optimization of Sports Utility Vehicle Chassis

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ABSTRACT: The vehicle chassis frame is an important part of an automobile. The chassis frame is the main structure of any vehicle. In this project work chassis for a SUV was designed using SolidWorks 2016 edition and analysed using Ansys R15.0. Chassis with side members having three different cross sections such as rectangular, square and circular were analysed by applying the working load and the results were compared to select the chassis with least total deformation. Then the selected chassis was modified and was subjected to a shear force and was analysed. Then the results were compared with analysis results of the initially designed chassis. Then the chassis with least value of total deformation was selected and was applied with three different materials and the results were compared to select the most suitable material. Then the chassis model with the least value of total deformation applied with the most suitable material was analysed and results were evaluated. Then modal analysis of the optimized chassis applied with the most suitable material was performed. The analysis data was used to perform the harmonic response analysis of the chassis and different properties of the chassis were analysed. From the results it can be concluded that chassis with rectangular cross section applied with ASTM A302 alloy steel is the best choice for sports utility vehicle.

KEYWORDS: Chassis, Crossmembers, ASTM A70 steel, Carbon steel AISI 4130, ASTM A302 alloy steel.

I. INTRODUCTION

A vehicle frame is the main supporting structure of a motor vehicle to which all other components are attached, comparable to the skeleton of an organism. Chassis frame is the basic frame work of an automobile. All the automobile systems like transmission, steering, suspension, braking system etc. are attached to and supported by the chassis frame. The frames provide strength as well as flexibility to the automobile. When the vehicle travels along the road, the chassis is subjected to excitations from the engine and transmission system as well as due to the road profile. Due to these excitations, the chassis begins to vibrate. Natural frequency of vibration coincides with the frequency of external excitation, resonance occurs, which leads to excessive deflections and failure. The ladder frame is one of the simplest and oldest of all designs. This was the first type of chassis to be designed. Almost all car manufacturers used it until the early 60's. Nowadays some SUV's still use it. As the name connotes, ladder chassis resembles a shape of a ladder having two longitudinal rails inter linked by several lateral members and cross braces. It uses few, large diameter tubes. Axles play an important role in sustaining weight. It consists of two symmetrical beams, rails, or channels running the length of the vehicle, and several transverse cross-members connecting them. Originally seen on almost all vehicles, the ladder frame was gradually phased out on cars in favour of perimeter frames and unitized body construction. This design offers good beam resistance because of its continuous rails from front to rear, but poor resistance to torsion or



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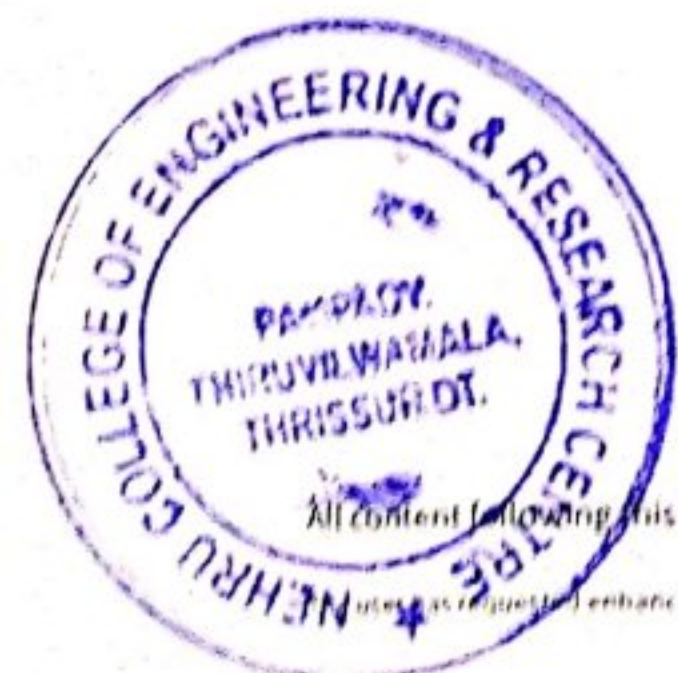
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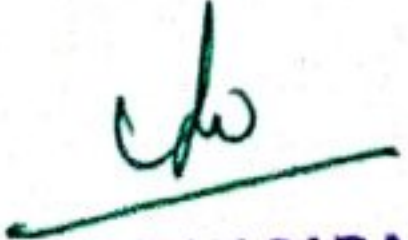
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PARAMETER AND MULTIPLE PERFORMANCE OPTIMIZATION OF MEDM THROUGH VARIOUS ELECTRODE FOR HEAT TREATED TOOL STEEL

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Abstract

Electric discharge machining (EDM) is a non-traditional machining processes that involved a transient spark discharges through the fluid due to the potential difference between the electrode and the work piece. In this research work is to determine the proper electrode material for machining tool steels work pieces using electrical discharge machining (EDM). Basically, improper choose of electrode material in EDM machine may result a few problems like the machine may cause of poor machining performance and it will decrease the accuracy of the products. This research work presents a fundamental study of characteristic of electrode discharge machine (EDM) that is electrode wear ratio (EWR) and material removal rate (MRR) by using different electrode materials in order to increase the understanding of EDM processes. To archive this, the characteristic of machining must be determined because the higher material removal rate (MRR) and less electrode wear ratio (EWR) will lead to better performance.

Keywords: Electric Discharge Machining (EDM), Electrode Wear Ratio (EWR) and Material Removal Rate (MRR), Performance Analysis, Optimization, DoE.

1. Introduction

Electrical discharge machine (EDM) is commonly used in tool, die and mould making industries for machining heat-treated tool steel materials. The heat-treated tool steels material falls in the difficult-to-cut material group when using conventional machining process. The high rate of tool wear is one of the main problems in electrical discharge machine (EDM). The wear ratio defined as the volume of metal lost from the tool divided by the volume of metal removed from the work material, varies with the tool and work materials used. If the rate of tool wear is high means that the material is easy to wear and not good for machining performance. A. M. Nikalj, et.al, [1]



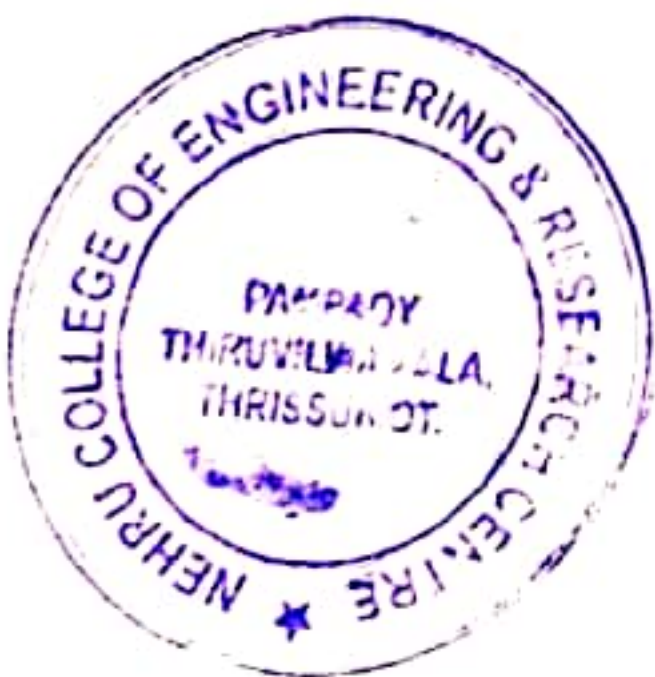


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Performance of a Compression Ignition Engine with Blends of Biodiesel (from a mixture of Spirulina Microalgae Oil and Sunflower Oil) and Diesel

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Abstract: In this paper, a high viscous micro algae oil, approximately 8 times more than that of diesel, obtained from spirulina micro algae using soxhlet apparatus was mixed with sunflower oil in three different volume percentage say 5:95 ml, 10:90ml and 15:85ml in order to decrease the viscosity by 40%. In addition, the above mixture was converted to biodiesel through two step trans-esterification process with methanol. Also, the produced 3 types of bio-diesel were mixed with pure diesel in 10:90 ml by volume percentage. Furthermore, a 5 HP single cylinder, 4 stroke, water cooled diesel engine was evaluated at constant speed with varying load by rope brake dynamometer using blends of biodiesel B10A, B10B and B10C with conventional diesel in terms of brake power, total fuel consumption, brake specific fuel consumption, brake thermal efficiency, brake specific energy consumption and volumetric efficiency. The study also includes, Physical and chemical property inspection, measurements of calorific value, PH value, flash and fire point and testing of calculated cetane index for biodiesel, blended biodiesel and pure diesel. It is inferred from the above study that the properties and performance of blended biodiesel are very close to the conventional diesel. The innovation in this paper as compared to the literature and our previously published paper is the usage of an alternative fuel to the diesel using biomass feedstock blended with Sunflower oil. Apart from, increasing the performance of a CI engine, it reduces our carbon footprint and pave a way to become a greener planet.



Temperature of Black Holes and Minimum Wavelength of Radio Waves

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ABSTRACT

The temperature for a black hole is identified as the temperature of the cosmic microwave background. The exact separating value for wavelength is found to classify electromagnetic waves into electric field waves and magnetic field waves. The maximum possible diameter of molecules in our universe is found. A Chandrasekhar's limit for black holes is used to guess somewhat reasonable values of radii for electrons, protons and neutrons.

Keywords: Electromagnetic Waves, Cosmic Microwave Background, Black Holes.

I. INTRODUCTION

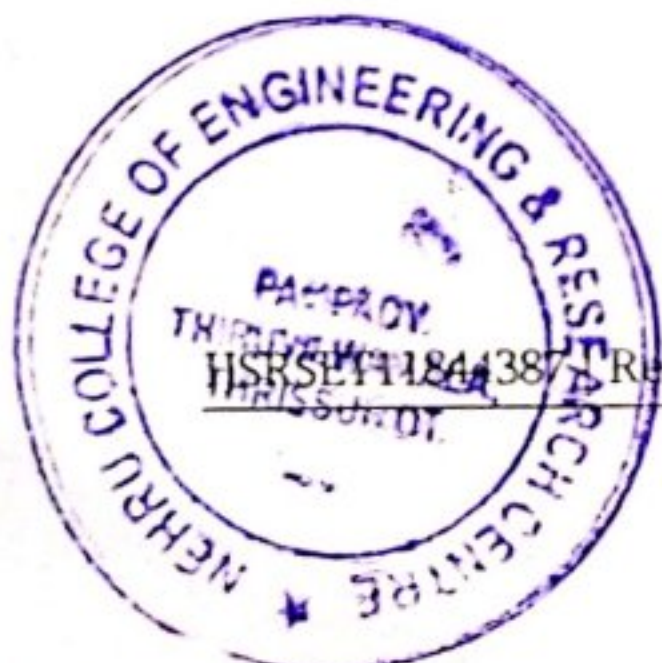
An electromagnetic wave is a wave which has the speed of light $c (=2.9979250 \times 10^8 \text{ m/s})$ in the vacuum. The authors established in the article [5] that there is a positive number w such that any electromagnetic wave with wave length less than w is an electric field wave which free from magnetic fields, and such that any electromagnetic wave with wave length greater than w is a magnetic field wave which free from electric fields. The present article fixes this value w approximately. The earlier article [5] tried to find the value of w by using the maximum possible diameter of molecules in our universe, when this maximum possible value was unknown. The present article also fixes this maximum possible value approximately. The theory developed in the article [5] also contradicted the existence of gravitational waves (see also [6, 7, 9]).

This article does not provide a definition for planets and stars. This article assumes the following hypothesis for the special theory of relativity. There is no particle and there is no energy wave which can have a speed that is greater than the speed of light c in the vacuum. This article assumes that the minimum possible mass of black holes is equal to 1.474 times of the mass of the sun, when the mass of the sun is $1.989 \times 10^{30} \text{ kg}$. This is a Chandrasekhar's limit given in the article [1]. The present article also assumes the following definitions, which may not be applicable to the articles of the other researchers.

Electric fields [3,4]: These fields are the fields which can be realized around electrons and protons.

Light ray/wave [3,4]: It is an energy wave with speed c in the vacuum and which is created by electric fields. It is also called an electric field wave.

Dark planet (object/star): It is a planet (object/star) which does not emit light waves, and which cannot emit light waves.



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Modified Fuzzy Controller of 3 Port DC-DC Converter Application for Renewable Energy Sources

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Abstract— Renewable energy sources have been one of the best alternative to ensure reliable energy source as it omnipresent free of cost and causes minimum environmental concerns. Among available renewable sources, photovoltaic (PV) generation, integrated with power backup storage unit, has been optimal choice for loads. The project proposes a fuzzy based three-port converter for simultaneous power management of multiple energy sources. The proposed converter has the advantage of using the least number of switches. The converter is capable of interfacing sources of different voltage current characteristics with a load. The proposed converter is constructed for a photovoltaic panel, Wind generator, a rechargeable battery, and a load. The efficiency of the converter is verified through MATLAB simulation. The proposed converter has reliability operate simultaneous power generation from different renewable energy source. Fuzzy controller controls the direction of power flow and load voltage of the converter.

Key words: Multiport Converter, Buck Boost Converter, Fuzzy Logic, MPPT, PV, Wind Generator

I. INTRODUCTION

Today's world has the interest to developing hybrid energy generation system, from different kind of renewable energy source. The hybrid energy generation system consist of some main issues are stability, reliability, and power quality. To use these problems storage element is used. The clean power generation world prefer PV panel and wind generation system. Multiport DC-DC converters have been proposed to do the efficient power management and load integration for the multiple sources.

To integrate multiple DC energy sources of different types to a power grid, multiple independent DC-DC converters are commonly used to step up the time-variant low-level source voltages to a constant high-level voltage that is required by a grid-tie inverter. Comparing to that solution, a multiport DC-DC converter is preferable, owing to the advantages of using fewer components, lower cost, higher power density, and higher efficiency.

The multiport dc-dc converter with energy storage has become a promising option for many instead of power systems, which including fuel cell vehicle, hybrid vehicle, renewable energy application and so on. It not only reduces the cost and improves the efficiency of the system performance. With its ability to reverse the direction of current flow and power. The multiport dc-dc converters are used to achieve the power transfer between sources and load. It is also regulated by the solar panel photovoltaic(PV) and wind turbine generator (WTG) wind level, thus to maintain stable load voltage and make fully usage of the

solar panel and wind turbine generator and the storage element battery.

The proposed converter has the least number of switches and thereby a lower cost. The newly introduced converter is applied for power management of a wind/solar hybrid generation systems, which consists of a WTG and a PV panel. The power generation from solar and wind energy are designed using perturbation and observation (P&O) MPPT algorithm, in which the WTG and PV panels can be controlled at the same time and extract the maximum power.

II. PROPOSED THREE PORT CONVERTER

The complete hardware setup of the proposed converter is shown with lamp load Fig.1. In this scaled down setup, the hybrid system are connected as input to the inverter, which is then connected to the synchronizing panel circuit to feed the domestic load. The switching pulses of the main inverter circuit are given from PWM pulse circuit generated through programming in dsPIC microcontroller. Hybrid sources are directly connected to bi- directional boost converter, then to the transformer less inverter and the supply is given to the load through synchronizing panel. The switching pulse for transformer less inverter is generated from dsPIC4011, a high performance Digital Signal Controller.

A DC input voltage of 20 V is engaged from solar PV cell and 1 watts of wind system, is transferred to bi-directional converter. The bi-directional boost converter as the input ranges from 0 to 12 V which feeds the boosted output voltage of 24 V to the transformer less inverter. The transformer less inverter converts input DC in to output voltage of AC ranging from 150 to 200. Synchronizing panel with double-end contractor compares sources, one from the inverter and other from the grid supplied to domestic loads such as lamp etc.

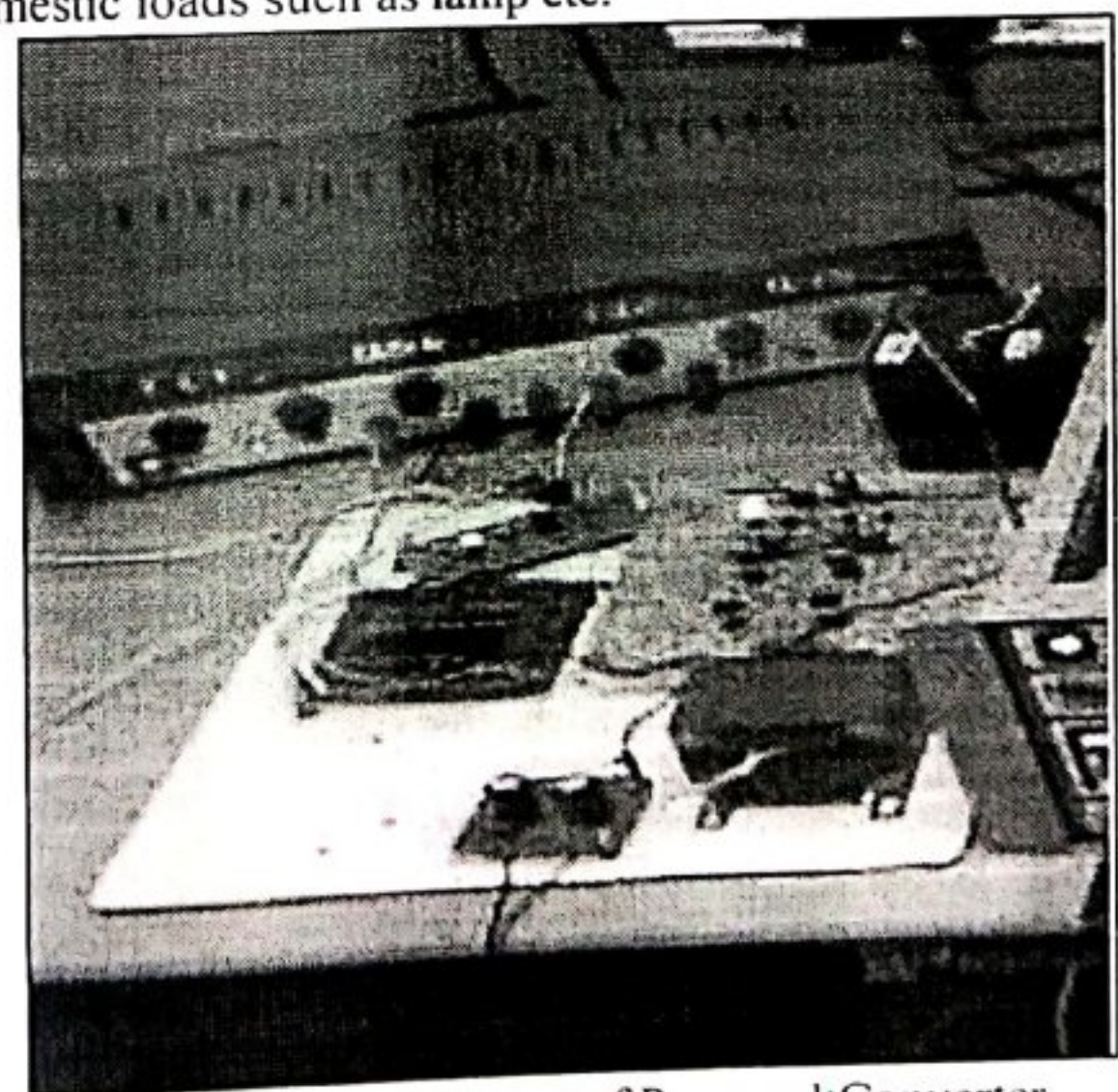


Fig. 1: Hardware setup of Proposed Converter




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WHAT IS THE POLARITY OF AN ELECTROMAGNETIC WAVE?**C. GANESA MOORTHY^{a1}, G. UDHAYA SANKAR^b AND G. RAJ KUMAR^c**^aDepartment of Mathematics, Alagappa University, Karaikudi, India^bDepartment of Physics, Alagappa University, Karaikudi, India^cDepartment of EEE, Nehru College of Engineering and Research Centre, Pampady, India**ABSTRACT**

There is no precise answer to the question: What is the polarity of an electromagnetic wave? Electromagnetic waves are identified as electric field waves or as magnetic field waves, but not both. This exclusive identification provided in this article fixes polarities of electromagnetic waves.

KEYWORDS: Maxwell Equations, Wave Equation, Electromagnetic Waves.

All things begin from Maxwell equations for electromagnetic theory. Both electric field and magnetic field satisfy a common wave (differential) equation, when these two fields vary simultaneously. This common differential equation is derived from Maxwell equations (see section 9.2.1 in (Griffiths; 1999)). Since these two varying fields satisfy same wave equation, it was assumed in history that both of them lead to electric field waves (EF waves) and magnetic field waves (MF waves) with common wave lengths. The electric field is perpendicular to the magnetic field, but these two waves travel in the same direction, which is perpendicular to both electric field and magnetic field. A wave called electromagnetic wave (EM wave) travels in the common direction of EF wave and MF wave. An anomalous property of EM waves is that they travel transversely, when their corresponding EF waves and MF waves do so. So, the "definition" for EM waves needs clarifications in connection with polarity. This problem of fixing polarity in giving the definition has to be solved. For this purpose, solutions of common wave equations for EF waves and MF waves have to be discussed.

SOLUTIONS OF WAVE EQUATIONS

Let us first consider a string vibration problem. Suppose a string of uniform linear velocity is stretched to a uniform tension and it is fixed at two ends. If the string is pulled aside and released from rest, then it vibrates transversely. The displacement with respect to time obeys a one dimensional wave equation (see chapter 5 in (Sneddon; 1957)). Its solution represents a wave motion. Initial conditions can be fixed for string problems, and 'wave solutions' may be obtained. Let us use the phrase 'wave solution' for a solution of a wave equation that represents a wave in nature. Some wave solutions may be obtained for wave equations satisfying initial conditions.

But all solutions of a wave equation need not be wave solutions. The wave nature of solutions depends on initial conditions. One can fix a position of the string with zero velocity at initial time, and one may obtain a wave nature for displacement. But, when the problem of producing EM waves is considered, there is no way (at present) to fix initial conditions for varying electric field as well as for varying magnetic field. So, it is not guaranteed for production of EF waves as well as for production of MF waves through any arbitrary procedure which follows the principle for production, because there is no method to fix suitable initial conditions leading to waves. Some unknown suitable initial conditions were satisfied in the first experiment of Hertz, and Hertz was successful in producing his EM waves. The waves obtained by Hertz are classified as 'microwaves'. Some initial conditions may lead to production of radio waves. Some initial conditions may also lead to production of light waves. To explain this statement let us discuss EF waves and MF waves.

EF WAVES AND MF WAVES

EF waves are the waves produced from variations in electric charges and variations in electric fields. If EF waves strike a conductor of electric charges, then the first reaction is movement of electric charges, more specifically, movement of electrons. As a second reaction, magnetic field may be varied. EF waves are transversal waves. For an example of EF waves, let us consider an invention of Thomas Edison. An electric current lamp with a resisting filament to produce light was experimented for his invention. The movements of electrons are restricted in the filament, when a current passes through the filament. So, there are variations in the electric field and in the magnetic field. Hence the Maxwell equations are satisfied, and hence a three


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A High Efficiency Step-Up DC-DC Converter Combining KY and Multilevel Modular Converter with Low Switching Voltage and Current Stress

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Abstract: A novel step up converter is presented, which combines the KY converter and the Multilevel Modular Converter (MMC). The proposed system combines KY and MMC. MMC is integrated to reduce the voltage and current stresses of switching device, improve efficiency, and fault-tolerant capability. The KY converter contains SR boost converter and coupled inductor with the turn's ratio it is used to improve the voltage gain. Therefore, the voltage gain is higher in the converter output, and can be determined by adjusting both the duty cycle and the turn's ratio. The proposed step-up converter has no floating output current, and reducing the output voltage ripple. By combining achieves the features of KY and MMC.

1. Introduction

Now a days the demand of green power is increased gradually. Solar, wind, fuel, geothermal, biomass are some sources of green power. Lot of applications, converters have much importance, such as boosting the small output voltage to high voltage. The voltage gains of buck-boost converter and traditional boost converter are not high for the loads need. Till now, a lot of voltage-boosting techniques presented, such as inductors and charge pump, coupled inductors, here the output voltage become floating, this will result to increase the complexity of the application, and also these converters are made up of so many components therefore the converters relatively complicated. In many situations the output current are non-pulsating, the voltage gain is inadequate. In HVDC use of DC/DC power converters increase output voltage to the high voltage (HV) level, and it results to efficient transmission for long distances. HVDC results to reduce the power losses, cabling cost, step up grid bulky transformer etc. A new Voltage boosting converter is described here, and combines KY converter with Multilevel Modular Converter. Here KY converter having one SR buck-boost converter connection, and also one coupled inductor having ratio, it is used to increase the voltage gain. The MMC containing SC or CC, SC or CC based

DC-DC converters are used in high power applications and they are having advantages like high power density, high efficiency and control simplicity. For offshore system the exponential voltage gain was implemented using SC DC-DC with the help of Marx concept. Combination of top and bottom cells provide high degree of modularity in each cells. The main important thing of modularity method is, when a single module fails, the converter can function at a reduced power level. It is also practicable to localize any fault in the system, hence system reliability can improve. It's having less maintenance, since it takes small interval of time to clear the fault. In modular structure the usage of cheaper components which is having low voltage / current stress in a system helps to distribute the power handling in multiple modules. MMC is integrated to reduce the voltage and current stresses of switching device, improve efficiency, and fault-tolerant capability.

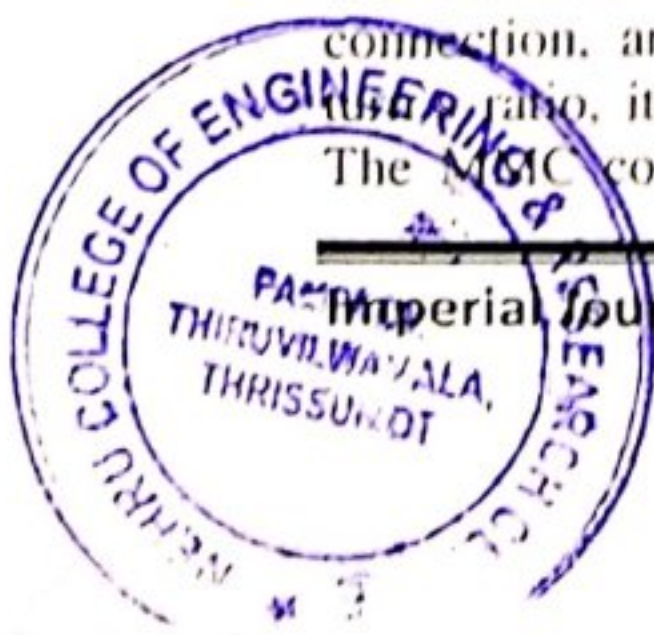
2. SYSTEM CONFIGURATIONS

There are two system to be explain, they are,

- 1 KY converter
- 2 Multilevel Modular Converter
- 3 Combination of KY converter and MMC

2.1 KY converter

The KY converter is shown in Fig 1, which consists of MOSFETs switches namely S_1 and S_2 . For voltage gain enhancement there uses a coupled inductor with turns ratio, its primary is known as N_p and the secondary is N_s . C_1 is known as energy transferring capacitor, C_2 is charge pump capacitor, A diode D_1 is used, the output side containing Output capacitor C_o , resistor R_o . The input voltage is V_i , output voltage is V_o .



Performance Analysis of H-Bridge Inverter Integrated For Renewable Energy Sources

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Abstract— An optimized third harmonic compensation strategy is proposed to improve the linear modulation range of single-phase inverter. The method injects the minimum amount of positive third harmonic into inverter by keeping modulation waveform amplitudes of over-modulation cells just being unity, then compensates same amount of negative third harmonic and properly distributes it to the normal cell. It has been observed and the simulation results are discussed. The two-level inverter has the lowest cost and weight in comparison with the other topologies. Hence it has very high THD and it is not practical to have an output voltage with high such THD. The design of the 5-level multilevel inverters seems to be better than the inverters. The proposed method is verified by the combination of battery storage power, capacitor bank and the solar PV Cell.

Keywords- Cascaded H-Bridge, PLL, SOC, MPPT, SPWM, DSPWM

I. INTRODUCTION

The use of renewable energy increased greatly just after the first big oil crisis in the late seventies. At that time, economic issues were the most important factors, hence interest in such processes decreased when oil prices fell. The current resurgence of interest in the use of renewable energy is driven by the need to reduce the high environmental impact of fossil-based energy systems. Harvesting energy on a large scale is undoubtedly one of the main challenges of our time. Future energy sustainability depends heavily on how the renewable energy problem is addressed in the next few decades.

Although in most power-generating systems, the main source of energy (the fuel) can be manipulated, this is not true for solar and wind energies. The main problems by using this energy source is cost and availability: wind and solar power are not always available where and when needed. Unlike conventional sources of electric power, these renewable sources are not “dispatchable” and the power output cannot be controlled. Daily and seasonal effects and limited predictability result in intermittent generation. Smart grids promise to facilitate the integration of renewable energy and will provide other benefits as well.

Researchers are focus to overcome a number of technical issues to deliver renewable energy in significant quantities. Control techniques are one of the key enabling technologies for the deployment of renewable energy systems. The maximum utilization of solar and wind power, it require effective control techniques. In addition, smart grids cannot be achieved without extensive use of control technologies at all levels.

A few control techniques have been proposed for CHB-based PV frameworks to satisfy the assignment of current controlling and MPPT [1]-[4]. The procedures in [1],[2] can accomplish control objectives, yet they don't consider the framework conduct under non-perfect conditions. In [3], an adjusted MPPT plot is displayed to enhance the framework execution under lopsided power conditions.

Be that as it may, the strategy shifts activity purpose of the PV module with high yield control from maximum power point (MPP) toward the voltage source locale of I-V bend, bringing about low vitality gathering. A mixture tweak methodology is portrayed in [4]-[6], which utilizes low recurrence exchanging for voltage adjust of dc-interface capacitors and the high recurrence sinusoidal pulse width modulation (SPWM) for molding yield air conditioning current. It can expand straight working district of CHB inverter contrasted with SPWM, since the maximum modulation index (MI) of square wave is $4/\pi$. notwithstanding, the strategy does not control dc-connect voltages precisely but rather balances them by charging or releasing dc-interface capacitors in view of the condition of framework, which could bother dc-connect voltages variance. A receptive power pay system is appeared in [5]-[7], which abuses the power factor as a level of opportunity to balance out the converter activity, yet the lower control factor may constrain its application [7].

II. OBJECTIVES

The main objective of the proposed method is to reduce the Total Harmonic Distortion in micro grids.

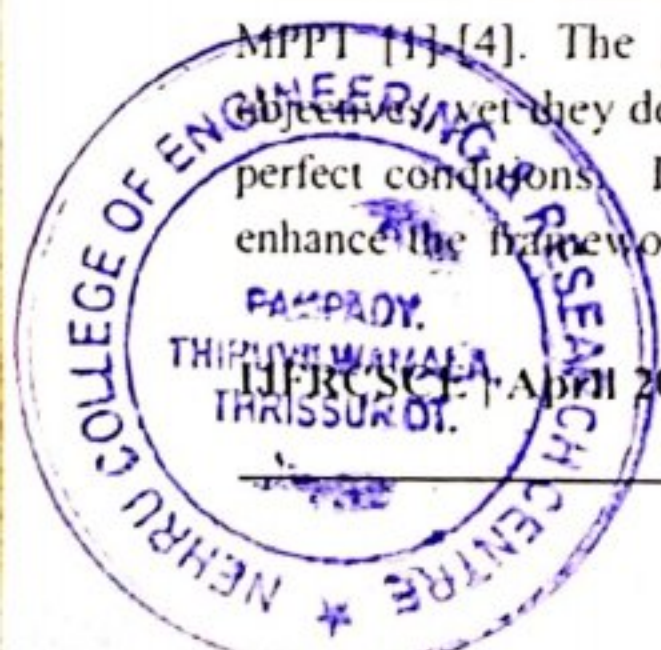
III. PROPOSED METHOD

The DC-DC converter has multiple input ports for connecting different sources, such as photovoltaic (PV) panels, wind turbine generators (WTGs), fuel cells, etc., The multiport DC-DC converter not only regulates the low-level DC voltages of the sources to a constant high level required by the inverter but also provides other important control functions, such as maximum power point tracking (MPPT). Figure 1 shows the block diagram of the hardware representation of the proposed system. Two input sources such as solar and wind, and a battery are connected to the converter. The operations of the switches are controlled through PWM signals these are generated by dsPIC controller. It generates error signals. These error signals compare the reference voltage with the actual voltage and generate PWM signals for switching operation. Then PWM

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A VELOCITY INDEX FOR EXISTENCE OF ATMOSPHERE IN A PLANET

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ABSTRACT

An index is defined in this article by the expression: Sum of rotating velocity and orbital velocity divided by escape velocity. This index is used to discuss the nature of existence of atmosphere in planets.

KEYWORDS: Escape Velocity, Rotating Velocity, Orbital Velocity.

One has to simplify a complex model to understand its nature. A simplification is to be adopted in this article to understand the nature of existence of atmosphere. A particle in atmosphere of a planet can leave the planet, because of the following reasons: (i) Inertia of the particle or the orbital velocity of the planet; (ii) Self-rotating velocity of the planet, when the particle touches the planet; (iii) Heat distribution on the surface of the planet; (iv) Cosmic rays including sun rays; (v) Gravitational fields of the other planets; and (vi) Depletion in ionosphere containing ionized particles [See, for example, for reasons in (Prakash, S. and Pandey, R. ; 1984), (Singh, R.N. and Upadhyay, H.O. ;1991), (Vats, H.O. and Deshpande; 1980)]. This article is to consider for simplification the first two along with the escape velocity for the particle in the planet to define an index that determines retaining capacity of planets to retain atmospheres. Interpretation also considers strengths of ionospheres in planets, to derive final conclusions on existence of atmospheres in planets. The indices are computed for all classical planets of our solar system.

VELOCITY INDEX

If the velocity of a moving particle in the atmosphere of a planet exceeds escape velocity for objects

of the planet, then the particle may escape unless other particles stop it. Two major reasons for particles to gain velocities to escape from planets are the self-rotating velocities and orbital velocities of the planets. Other factors are ignored, and a uniform 'velocity index' is introduced.

$$\text{Velocity index} = (\text{Rotating velocity} + \text{Orbital velocity}) / \text{Escape velocity.}$$

The earlier discussion implies the following conclusion. If the velocity index of a planet is less than or equal to 1, then atmosphere exists, that is, the atmosphere is retained; otherwise, it does not exist. However, non existence status of atmosphere may be converted into existence status of atmosphere, when there is a strong layer of ionosphere, which does not allow particles of lower layers to escape. In the table given in this article, some approximate data are provided for escape velocity, orbital velocity and rotating velocity, and these data are already available. See, for example, the website: nssdc.gsfc.nasa.gov/planetary/factsheet/index.htm. Rotating speed at the equator can be calculated after conversion of units. (Table 1)

Table 1:

Planets	Escape velocity (km/s)	Orbital velocity (km/s)	Rotating speed at equator (km/h)	Velocity index
Mercury	4.3	47.4	10.8937	11.02
Venus	10.4	35.0	6.5226	3.37
Earth	11.2	29.8	1677.4140	2.70
Moon	2.4	1+29.8	16.6561	12.84
Mars	5.0	24.1	867.7317	4.87
Jupiter	59.5	13.1	45391.7170	0.43
Saturn	35.5	9.7	35404.3900	0.55
Uranus	21.3	6.8	9340.4651	0.44
Neptune	23.5	5.4	9668.2600	0.34
Pluto	1.3	4.7	48.5884	3.63




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Why Do Distant Planets Have Speedy Winds?

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Abstract: A reason for existence of high speed winds in the planets which are far away from the sun is explained in this article. This is explained with the help of an index for idleness of air molecules on the surfaces of planets, and the surface temperatures of planets.

Key words: Escape velocity, Rotating speed, Friction.

1. Introduction

The planets which are far away from the sun of our solar system can receive small amounts of energy from the sun. The planets which are near to the sun receive more sun energy than the sun energy received by the planets which far away from the sun. The speeds of the winds in distant planets are much greater than the speed of the winds in the nearer planets. Researchers had a belief that the surfaces of the distant planets received internal energies from the core parts of the planets, and these internal energies helped to create high speed winds in these planets. The ultimate logic is that energies received create high speed winds, by means of local variations in temperatures. It assumes that internal energies have been continuously used in the distant planets to create high speed winds in case of variations in temperatures. But, these planets should have cyclically stable temperatures at present on the surfaces in view of their ages, and internal energies cannot change at present cyclically stable temperatures on the surfaces. So, there is a need to find a correct reason for existence of high speed winds in distant planets. A new reason is proposed in this article. The new reason is the fact that, in general (see [2]), the friction increases between two moving surfaces when the temperature of one surface increases, or equivalently, the friction decreases between two moving surfaces when the temperature of one surface decreases. Although this is not true for surfaces of some materials (see [1]), it is assumed in this article that the surfaces of

planets obey this assumption. A careful analysis is made in this article to select correct parameters for planets to apply this assumed fact about friction. Based on this selection of parameters, an index for idleness of air molecules on the surfaces is introduced in this article.

The authors also made a careful analysis in selection of parameters to introduce a velocity index in the article [3] to determine the capacities of planets to retain air molecules for atmospheres. It was pointed out in that article [3] based on velocity index values that the moon of our earth and the planet mercury do not have capacity to retain molecules, and that the planets mars and Pluto have very little capacities to retain air molecules. Let us observe that air molecules are always produced on the surfaces of the planet mercury and the moon of our earth, because of continuous reactions which happen on the surfaces. This present article is applicable for all planets with or without atmospheres, because this article focuses on the existing air molecules on the surfaces of the planets. Winds are considered as movements of air molecules on the surfaces.

2. An index for idleness

The critical velocity at the equator of a planet along the direction of the rotation is the escape velocity divided by the square root of 2. In view of this physical interpretation of the critical velocity, it is observed that a particle on the equator of the surface of a planet moves in an almost circular path in the direction of rotation, if the particle has a velocity in the direction of rotation such that this velocity is just greater than the critical velocity in the equator. So, if the self-rotating velocity at the equator of a planet exceeds the critical velocity at the equator of a planet, then the condensed matters at the equator of the planet will get decay. This means that a planet with condensed matters cannot exist, if its rotating speed at the equator exceeds its critical



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PERFORMANCE INVESTIGATION, SIMULATION AND TESTING OF VERTICAL AXIS WIND TURBINE WITH OMNI-DIRECTIONAL DUCT FOR TALL BUILDING IN URBAN LOCATION

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ABSTRACT

In this paper an efficient design for enhancing the performance of the ducted wind turbine (DWT) mounted in the tall buildings is presented. The DWT generates differential pressures and also causes mass flow through a building integrated turbine. By the help of Catia V5 software a successful design was completed for building mounted duct wind turbine and also computational fluid dynamics (CFD) modelling of optimum design with an octahedral casing was chosen. A comparative study is done with the results of CFD analysis and actual wind turbine. By this innovative design cost of the tower is completely reduced and also omnidirectional intake helps in capturing wind with the seasonal direction. During the wind pressure the flow within augmented openings which subsequently accelerates, expands and releases into the environment. The process involves capture, acceleration and concentration of wind into the turbine. The increased kinetic energy will drive the permanent magnet generator.

Keywords: ducted wind turbine, tall buildings, permanent magnet rotor, Catia V5, computational fluid dynamics.

INTRODUCTION

As we know that wind is abundant source of energy, but the problem lies in harvesting it. By implementing venturi concept, the performance of wind turbine can be enhanced. It is claimed that, using a duct system, the incoming wind can be enhanced and thereby the power output also increased. In this research work introduces the various author concepts are [1] W.T. Chong and K.C. Pan, *et al*, introduces the concept of performance investigation of shrouded wind turbine has advantages over conventional wind turbine and implemented power-augmented-guide-vane (PAGV) has 5.8 times efficiency higher was analyzed by CFD. [2] Yuji Ohya and Takashi karasudani, developed a new wind turbine system consists of a shroud diffuser and the efficiency is 2-5 times better than the bare wind turbine and due to vortex formation behind the rim, draws more mass flow inside the wind turbine. [3] R. Noble introduces the vertical axis wind turbine of low tip speed ratio less than 5 and also investigated for the 2-D flow around VAWT blades by CFD is very strongly studied. [4] Francisco Toja- Silva and Antonio Colmenar- Santos, results shows that horizontal-axis wind turbines have better performance in flat-terrain applications, where as in buildings vertical-axis wind turbines generates more power. [5] W.T. Chong and K.C. Pan, *et al*, introduced Omni-directional-guide-vane (ODGV) integrates wind power generation system improves the power output of a VAWT and it has great potential to be sited in urban areas for on-site and grid-connected power generation. [6] Islam Abohela, Neveen

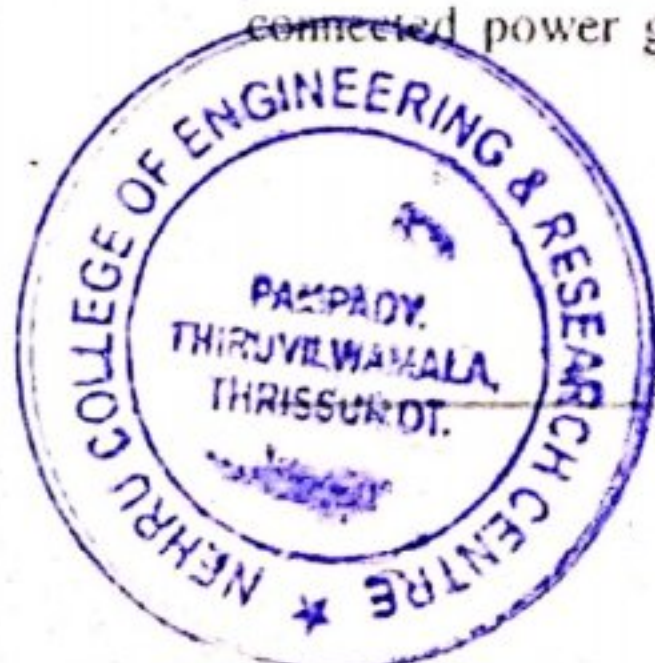
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SYSTEM DESCRIPTION

As we know, the wind energy is an abundant source of renewable energy, but the problem lies in the harvesting. How efficiently the system can be designed is very important.

The Figure-1 shows the overall design of the duct system which is designed using CATIA. Following are the advantages of the use of venturi augmented duct system.

- Increased velocity is obtained at the turbine.
- In low velocity of wind, power output can be obtained because of the usage of venturi section.
- Since it consists of omnidirectional intakes, change in direction of wind will not differ the performance of the wind turbine.



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Performance and Emission Analysis of a CI Engine Fuelled with JOME-JOEE-Diesel Blends

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Keywords: Biodiesel, Jatropha curcas oil, CI Engine performance test, Engine emission test

Abstract. In this study a high viscous liquid fuel, approximately 20 times more than that of diesel, produced from non-edible oil seed jatropha curcas which has been considered as an alternative fuel for the compression ignition engine is reduced through trans-esterification process. During this process, the raw jatropha curcas oil is preheated to 60°C and treated with methanol 20% by volume along with potassium hydroxide (KOH) by 0.568% of the oil weight as alkaline catalyst at 60°C reaction temp to produce Methyl Esters of Jatropha Oil (JOME). Similarly, the above method is followed to produce Ethyl Esters of Jatropha Oil (JOEE) with preheating at 70°C. In addition, 2% glycerol is added to the mixture to improve the reaction rate. The lower viscous fuel biodiesel (JOME and JOEE) produced by trans-esterifying of jatropha oil is blended with pure diesel 50% by volume. An experimental investigation have been carried out without altering the CI engine to examine the performance parameters in terms of brake thermal efficiency, total fuel consumption and brake specific fuel consumption for several engine load from 0 Kg to 8 Kg. The study also includes, separation of crude biodiesel from glycerol, washing of crude biodiesel, examination of calorific value using bomb calorimeter, viscosity measurement using redwood and brookfield viscometer, engine emission test and cost comparison for production of one litre of JOME and JOEE. It is inferred from the above study that the blends of JOME with diesel have closer performance to diesel when compared to the blend of JOEE with diesel. But, on comparison of their exhaust emission, the JOEE showed reasonable lower exhaust emission CO and NO_x in spite of its higher calorific value when compared with JOME. The study also revealed that the biodiesel can be adopted as an alternative fuel for existing diesel engine without any modification.

Introduction

Biodiesel is a clean-burning fuel produced from non-edible oil seeds such as Jatropha, Pongamia pinnata (Karanja) which can be grown on wasteland, grease, animal fats etc. However, the oil extracted from these seeds has high viscosity (20 times more than that of diesel) which causes serious lubrication, oil contamination and injector chocking problems. These problems are solved through trans-esterification, a process where these raw vegetable oils are treated with alcohol (methanol or ethanol with catalyst) to form methyl or ethyl esters. The monoesters produced by trans-esterifying vegetable oil are called "biodiesel" having lower fuel viscosity with higher octane number and heating value. Endurance tests show that biodiesel can be adopted as an alternative fuel for existing diesel engines without modification. In EU and USA, edible vegetable oil like sunflower, groundnut, soya bean, cotton seed, etc. are used to produce biodiesel. India is endowed with a number of non-edible vegetable oil producing trees which thrives in inhospitable conditions of heat, low water, rocky and sandy soils, a renewable resource of economic significance (Jajoba in Rajasthan). The concept dates back to 1885, when Dr.Rudolf Diesel developed the first diesel engine to run on vegetable oil. In recent past, the use of bio oil as an alternative renewable fuel to



Optimization of Cutting Parameters in Machining GFRP Using End Mill Cutter through DoE and Verification through Genetic Algorithm

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Keywords: Machining Parameter, Vertical Machining Centre, Glass Fiber Reinforced Plastic, High Speed Steel Tool.

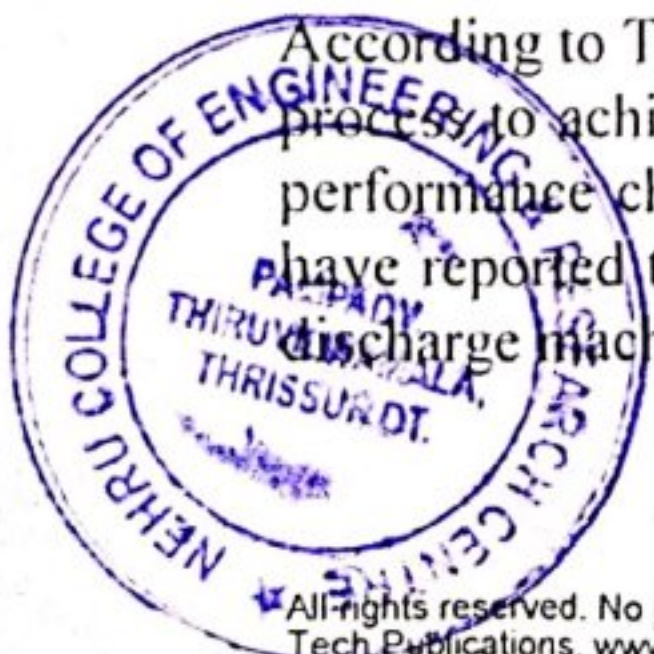
Abstract. This article discusses optimization of critical parameters such as cutting speed, feed, depth of cut and method of machining while machining Glass Fiber Reinforced Plastic (GFRP) in vertical machining center using standard end mill cutter made up of High Speed Steel (HSS) for lesser cutting load, maximum material removal rate for better surface finish and dimensional accuracy through design of experiments. In composite material machining, surface finish is the critical deciding factor in determining surface quality. In this study, as per Taguchi's L₉ orthogonal array, predictable and unpredictable parts are followed to evaluate the consequence of cutting parameters on the machined component. The study includes surface roughness measurement using surface profilometer continued by physical measurement of machined pocket dimension. The experimental results, suggest suitable machining parameters in order to achieve the above target goal. In addition, C++ program is developed to cross check the most favorable machining parameters for maximum material removal rate using genetic algorithm. It is inferred from the study that the genetic algorithm results coincides very closely with the result given by the method of design of experiments.

Introduction

The term composite material is commonly used to describe a material whose components do not occur naturally as an alloy, but have been separately manufactured before these being combined together. Thus, a composite can be defined as the mixture of two or more component that is used in the combined condition to compensate the deficiency of any property in one by the abundance of that in the other. This combination of materials exhibits properties distinctly different from those of the individual materials used to make the composite. Glass is drawn as a very thin filament of diameter in the range of 10-25 microns and put into a matrix of unsaturated polyester resin. The successive layers can be built up into large pieces. A bunch of fibres put together in different forms can serve different application. This leads to a two-component material called Glass Fibre Reinforced Plastic (GFRP). This combines the strength of the glass fibre with the shock resistance and formability of plastic.

According to Santhanakrishnan [1] though there are different classification of composite material, the glass fibre reinforced plastic materials offer wide spread engineering applications such as aeronautical, wind industries and so on because of its light weight, higher strength, resistance to conduct of heat and electricity, high anti-corrosiveness, very longer service life, easier to repair and etc. So, the importance of proper machining of composite material tremendously increased.

According to Taguchi [2] evaluating machining parameters are an important factor in the machining process to achieve high quality products. Now a day, the Taguchi method is used to optimize the performance characteristics of process parameter to achieve quality components [3]. Lin et al. [4] have reported the application of the Taguchi method with fuzzy logic for optimizing the electrical discharge machining process with multiple performance characteristics.



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Design of Reheater for Superheated Steam in Water Tube Boiler

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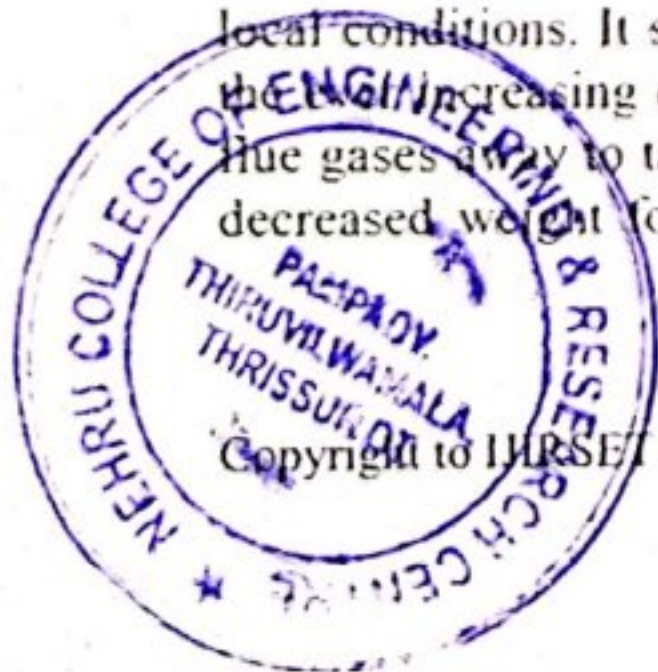
ABSTRACT: Boiler, also known as steam generator, is a closed vessel in which water is converted into steam above the atmospheric pressure by the application of heat. The steam generating unit is defined as "A combination of apparatus for producing, recovering heat together with the apparatus for transferring the heat.,A water tube boiler is a type of boiler in which water circulates in tubes heated externally by the fire. Fuel is burned inside the furnace creating hot gases which heats water in the steam generating tubes. In this project water tube boiler is kept under study and problem of steam venting is identified. A system is to be developed in order to avoid the situation by heating the steam externally.33 tone/ hour capacity water tube boiler is kept under study. As per the design 24 tone/hour saturated steam and 9 tone/hour superheated steam is produced. The pressure conditions are 25 bar and 19 bar respectively. The temperature of saturated steam is 225°C and superheated steam is 330°C. The correct temperature of superheated steam is maintained only when the load conditions (24:9) are satisfied. When the demand of saturated steam is reduced superheated steam doesn't get correct temperature. Presently in this situation in order to maintain correct temperature of superheated steam some quantity of saturated steam is vented out. When this situation occurs temperature of superheated steam is reduced to 250°C. Average 4 to 5 tone steam is vented in an hour. Cost of steam is around Rs3500/ tone. In order to avoid the situation of steam venting and to attain the proper temperature of superheated steam a reheater for superheated steam is designed and it is analyzed using ANSYS software. Also study about boilers is conducted. From the ANSYS analysis get the output temperature of steam is 340°C, which satisfies our demand. And from the cost estimation it is proved that the system is economical.

KEYWORDS: Text detection, Boiler, Reheater, Design, superheated steam

I. INTRODUCTION

Boiler, is a closed vessel in which water is converted into steam by the application of heat. The steam generating unit is defined as "A combination of apparatus for producing, recovering heat together with the apparatus for transferring the heat. By the middle of eighteenth century boilers were invented. The first boilers were capable of producing steam at a constant low pressure over a considerable period of time and with minimum amount of attention and the engines which used steam could operate at constant speed performing useful work. In those days the designers were confronted with difficulty of obtaining suitable materi. Concurrent with the introduction of steam machinery, coal mining, which until then had been of low production came to the fore, and coal quickly became the fuel for the manufacture of iron and for steam production.

Boilers in those days were designed for low pressure and were often of very peculiar shape to meet various local conditions. It soon became apparent, however that circular form was the best for resisting internal pressure, and increasing demand for steam in factories led to the development of large tank boilers, fired externally, with due gases and tall chimney at high temperature. Later the need for quickly raising of steam increased power and decreased weight focused their attention on water tube boilers for steam production. Boilers can be classified into





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Performance and Emission Analysis of a CI Engine Fuelled with JOME-JOEE-Diesel Blends

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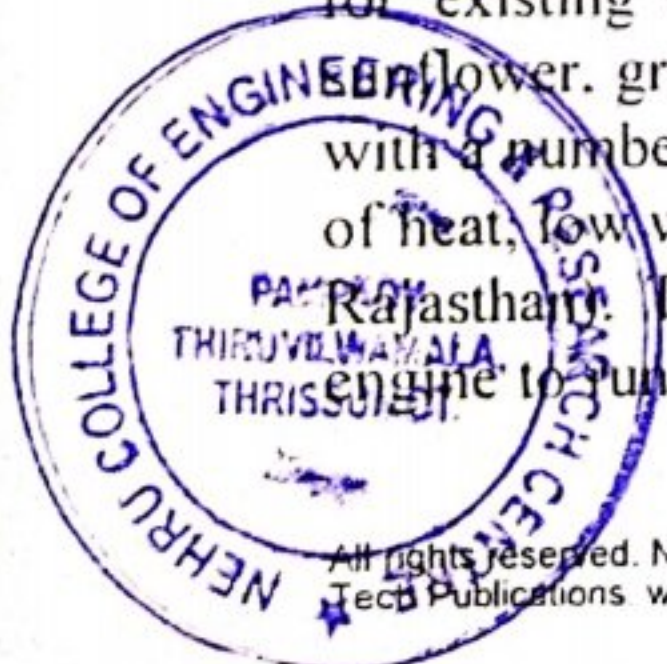
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Keywords: Biodiesel, Jatropha curcas oil, CI Engine performance test, Engine emission test

Abstract. In this study a high viscous liquid fuel, approximately 20 times more than that of diesel, produced from non-edible oil seed jatropha curcas which has been considered as an alternative fuel for the compression ignition engine is reduced through trans-esterification process. During this process, the raw jatropha curcas oil is preheated to 60°C and treated with methanol 20% by volume along with potassium hydroxide (KOH) by 0.568% of the oil weight as alkaline catalyst at 60°C reaction temp to produce Methyl Esters of Jatropha Oil (JOME). Similarly, the above method is followed to produce Ethyl Esters of Jatropha Oil (JOEE) with preheating at 70°C. In addition, 2% glycerol is added to the mixture to improve the reaction rate. The lower viscous fuel biodiesel (JOME and JOEE) produced by trans-esterifying of jatropha oil is blended with pure diesel 50% by volume. An experimental investigation have been carried out without altering the CI engine to examine the performance parameters in terms of brake thermal efficiency, total fuel consumption and brake specific fuel consumption for several engine load from 0 Kg to 8 Kg. The study also includes, separation of crude biodiesel from glycerol, washing of crude biodiesel, examination of calorific value using bomb calorimeter, viscosity measurement using redwood and brookfield viscometer, engine emission test and cost comparison for production of one litre of JOME and JOEE. It is inferred from the above study that the blends of JOME with diesel have closer performance to diesel when compared to the blend of JOEE with diesel. But, on comparison of their exhaust emission, the JOEE showed reasonable lower exhaust emission CO and NO_x in spite of its higher calorific value when compared with JOME. The study also revealed that the biodiesel can be adopted as an alternative fuel for existing diesel engine without any modification.

Introduction

Biodiesel is a clean-burning fuel produced from non-edible oil seeds such as Jatropha, Pongamia pinnata (Karanja) which can be grown on wasteland, grease, animal fats etc. However, the oil extracted from these seeds has high viscosity (20 times more than that of diesel) which causes serious lubrication, oil contamination and injector chocking problems. These problems are solved through trans-esterification, a process where these raw vegetable oils are treated with alcohol (methanol or ethanol with catalyst) to form methyl or ethyl esters. The monoesters produced by trans-esterifying vegetable oil are called "biodiesel" having lower fuel viscosity with higher octane number and heating value. Endurance tests show that biodiesel can be adopted as an alternative fuel for existing diesel engines without modification. In EU and USA, edible vegetable oil like lower, groundnut, soya bean, cotton seed, etc. are used to produce biodiesel. India is endowed with a number of non-edible vegetable oil producing trees which thrives in inhospitable conditions of heat, low water, rocky and sandy soils, a renewable resource of economic significance (Jojoba in Rajasthan). The concept dates back to 1885, when Dr.Rudolf Diesel developed the first diesel engine to run on vegetable oil. In recent past, the use of bio oil as an alternative renewable fuel to



Routing, scheduling and allocation of municipal solid waste collection and disposal trucks - A case study report on Tier II City of India

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ABSTRACT

The corporations and municipalities in the world are spending an enormous amount of money in collection and disposal of solid wastes. Transportation of municipal solid waste (MSW) from collection point to the disposal destination is an important aspect which needs attention. This study is focused on route optimization of the solid waste collection trucks. For this, Prim's algorithm was used to find the shortest route. Further for using the existing infrastructure, based on the capacity of bins and trucks, the trucks are allocated using the allocation algorithm. The algorithms proposed are validated using Java programming. The results show that there is considerable reduction in the collection and disposal time in comparison with the existing system.

Key words : MSW, Optimization, Prim's algorithm, Allocation algorithm, Java programming

Introduction

In the last few decades urbanization is taking place in all the cities across the world very rapidly. About 75 % of the total population of developed countries are living in urban area and which will increase to 84 % by the end of 2030. While considering India the population of Mumbai is 18.1 million in the year 2000 increased to 26.1 million in the year 2015, that shows an increase of 44%, in New Delhi the population increased by 44% whereas Kolkata by 37 %. The urban population of developing countries will touch 50 % by 2020 Urban Millenium, 2011. The fast urbanization is a challenge for drinking water, clean air and disposal of solid waste. The rapid industrialization and urbanization is a challenge to the environment. The major impact is on disposing the

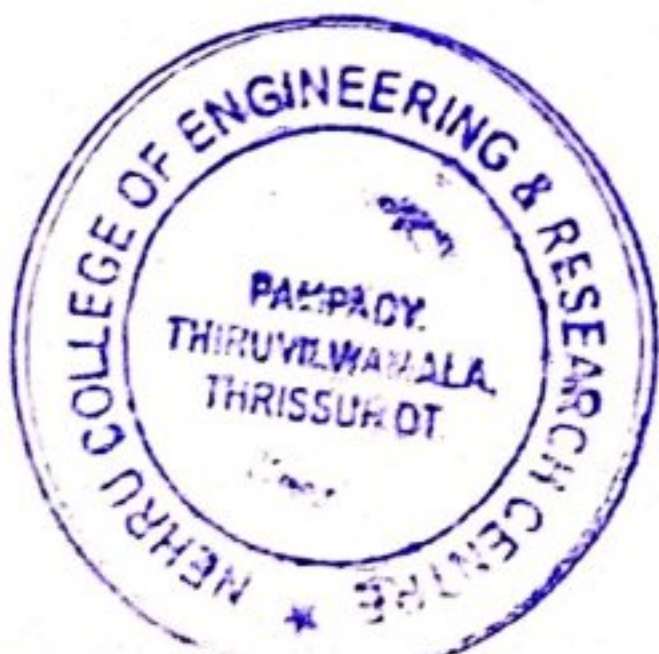
solid waste from household and market area.


The proper routing of MSW collection truck is one of the major issue. It is noted that the expenditure incurred for the collection and proper disposing of the solid waste is found to be approximately 60 to 80 % of the total sanitation expenses (Katkar, 2012). Hence any little improvement in the method of routing of the truck will give a significant reduction in the expenditure. This paper primarily emphasis on routing of the collection trucks from the various locations to the disposal area by utilizing the available infrastructure (trucks).

In this study for obtaining the shortest route Prim's algorithm was used and an allocation algorithm is proposed for the use of existing infrastructure, based on the capacity of bins and trucks which is discussed in the later part of this paper.

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Design and Development for Exhaust Back Pressure Reduction with Noise Control for Motorcycles

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ABSTRACT: Motorcycle Back Pressure reduction is the process of reducing the resistance created by the motorcycle exhaust system that has been created for Noise Reduction so as to meet the standards of Noise Pollution within the atmosphere. The design is based on the concept of reducing the Back Pressure created inside and to maintain the noise at the tail pipe of the exhaust system by the introduction of new concept of Wedge Theory which has been designed and Analyzes on ANSYS Software for its advantages, and also the introduction of Pressure Maintainer Valve helps in maintaining the reduced back pressure for, so as to maintain a correct ratio maintaining.

KEYWORDS: Back Pressure, Noise Reduction, Wedge Theory, ANSYS Software, Pressure Maintainer Valve.

I. INTRODUCTION

The conventional mufflers commonly use the baffle system that it generate high amount of back pressure that hinders the working of engine by resisting the flow creating a high pressure at the port with respect to the exhaust system this enables the air fuel get choked inside the combustion chamber, each cycle when this happens for the next cycle we will have to accelerate the engine because when the exhaust gas gets trapped inside the chamber of combustion there may not have enough space for the fresh air to enter the chamber of combustion so for the power stroke or expansion stroke does not get enough power from the fresh fuel because of trapping. So for combating this problem we are introducing the absorption system. which enables the flow of exhaust gas to move freely but there comes the problem of sound, according to standards of exhaust the vehicle or the motorcycle that we are considering has the standard of about maximum of 90dB, the maximum loudness the Indian standards are allowing for the reduction of noise pollution in the atmosphere. So we must design a muffler that reduces back pressure as well as noise that paves a way for the increase in power inside the engine and can reduce the process on noise generation.

II. RELATED WORK

Design and Analysis of Automotive Silencer for Effective Corrosion Control, Automobile silencers have the headache of corrosion from existence. So, initial corrosion resistant materials are growing day by day. We here use



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CFD Simulation of Injection Mixer for CNG Engines

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ABSTRACT: The inadequate mixing of air fuel mixture in engines is one of the main reasons for insufficient engine performance and emission of harmful gases. In this project CFD analysis of injection manifold of the CNG engine is carried out using the RNG K-ε turbulent model. CFD results obtained from the existing model are compared with the modified model. The engine specifications are 125cc CNG engine with single nozzle fuel atomizer. In the modified model we are using cd atomizer as well as 3 nozzle atomizer for analysis. In this analysis the pressure, temperature and velocity contours inside the cylinder are compared for existing and modified model. We are carrying out 2d analysis.

KEYWORDS: ANSYS CFD, Fuel Injector.

I. INTRODUCTION

With increase in awareness among the researches about the harmful effects of use of fossil fuels and their depletion at a higher rate due to excessive usage, the need to find alternative fuels has become the need of the day. There are large numbers of alternatives available but the selection of best out of the lot is also necessary. The use of compressed natural gas is continuously increasing due to some of its advantageous properties. As per research about 1.1 million CNG vehicles have been reported in India. CNG is actually methane gas stored at high pressure. The emissions from CNG engines or the compression products are carbon dioxide and water. Methane is the cleanest burning hydrocarbon as it is completely freed from contaminants during its processing. Due to its effective mixing it is highly recommended fuel. It can be used in place of petrol, diesel and LPG. As it is lighter than air it is safer than other fuels in the event of spill. CNG may be found above oil deposits, or may be collected from landfills or wastewater treatment plants where it is known as biogas.

CNG is used in traditional gasoline/internal combustion engine automobiles that have been modified or in vehicles which were manufactured for CNG use, either alone ('dedicated'), with a segregated gasoline system to extend range or in conjunction with another fuel such as diesel. In response to high fuel prices and environmental concerns, CNG is starting to be used also in tu-tu-tu and pickup trucks, transit and school buses, and trains.

II. RELATED WORK

Nimit M. Patel [1] he has studied and replicated injection nozzle at different locations using Computational Fluid Dynamics software to get the best mixing in the combustion chamber of the engine. The other modification is done in the injection nozzle is the velocities of the fuel in combustion chamber. That also determined from the software. The length of bore and stroke of the engine is selected from the actual diesel engine and it has been modelled using Gambit software. From the various results the air and fuel mixing is very good and better when compared with the original injection nozzle. The velocity of fuel in combustion chamber gets from the simulation is highest for the new design. During the study for optimization of gas injector orientation there is relation is developed for better thermal efficiency.

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CFD Analysis of Aerodynamics of Car

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ABSTRACT: With growing awareness among people about conservation of non-renewable energy like fossil fuels researchers and scientists are investigating a lot on how to reduce the consumption of these fossil fuels either by using alternative fuel or by improving the performance of the gadgets like vehicles, aeroplane and other energy converting devices. There are many papers published in the past in field of aerodynamics of vehicles intended to optimize the geometry of these vehicles to reduce the fuel consumption and maximize the performance by reducing the aerodynamic drag. Researches in this field are still growing in numbers. This paper also intends to reduce the aerodynamic drag by studying the flow field around the car. This paper compares the results obtained from CFD analysis of the existing model and the modified model with a duct added to the roof of a sedan model car. The analysis is carried out using ANSYS Fluent and the car 3D model is created using CATIA V5.

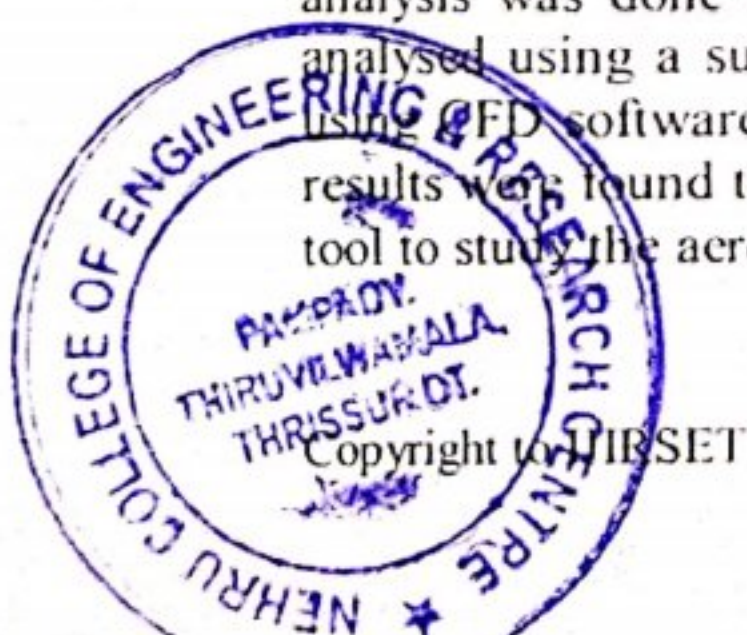
KEYWORDS: ANSYS CFD, Aerodynamics & Drag Force.

I. INTRODUCTION

When the vehicle is moving at a particular velocity, the viscous effects in the fluid are observed only to a thin layer called boundary layer. Outside the boundary layer viscous effects are not felt i.e. flow is inviscid. This fluid flow imposes pressure on the edge of boundary layer. When the air reaches the rear end of the vehicle, the fluid gets separated. Within the boundary layer, the motion of the fluid is governed by the viscous property of the fluid. There does not exist any Boundary layer for Reynolds number lower than 104. Reynolds number depends on the characteristic length of the body, the kinematic viscosity and the velocity of the vehicle. In other words, the fluid moving around the vehicle depends on the shape of the vehicle and the Reynolds number. Another phenomenon which affects the flow of fluid past the vehicle body and the performance of the vehicle which known as 'Wake'. When the air moving over the vehicle gets separated at the rear end, it creates low pressure turbulent region behind the vehicle known as the wake. This contributes to the pressure drag, which reduces of the vehicle performance.

II. RELATED WORK

Abdul Razzaque [1] studied about the design of a vehicle to minimize the drag force to get at economic model with optimized the performance. He analysed the 3D design model of Tata Indica car designed using Pro-E 5.0 and used ANSYS Fluent platform to analyse the flow field around the car. His work was concerned and intended on reduction of the coefficient of drag & drag force on car body by optimizing the exterior shape using CFD software. This analysis was done to calculate the coefficient of drag and drag resistance. Different design parameter of car was analysed using a suitable turbulence model and comparison of coefficient of drag of the car model was carried out using CFD software he validated his experimental result using CFD analysis/experimental studies. The experimental results were found to agree with the results found through CFD analysis which shows that CFD analysis is an effective tool to study the aerodynamic design of cars.





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CFD Analysis of a Thrust Vectoring Nozzle

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ABSTRACT: Thrust Vectoring is a moderately new innovation which has been discussed for quite a while, and it can give present day military flying machine with various points of interest in regards to performance such as enhanced manoeuvrability, shorter take-off, broadened flight envelope and survivability. Furthermore, as a result of Thrust Vectoring, there is additionally the ability to independently control the exit section of the nozzle, which permits to have dependably an "adjusted" nozzle to each flight condition and motor power requirements.

The work aims at "prediction of temperature profile and speed at the exit of nozzle of rocket in space utilizing fluent tool in Ansys workbench." The simulation includes the forecast of temperature profile and velocity profile inside the rocket nozzle. The simulation done is utilized as a part of external air conditions by varying of pressure in vacuum thought in external air condition. creo ptc is used for design of models and ansys fluent is used for cfd analysis. By taking a standard arrangement of the nozzle the shapes and charts are acquired. Further comparisons are done for modified configuration by varying the exit section shape from circle to decagon, keeping length and diameter constant.

KEYWORDS: ANSYS CFD, creo ptc, converging-diverging nozzle.

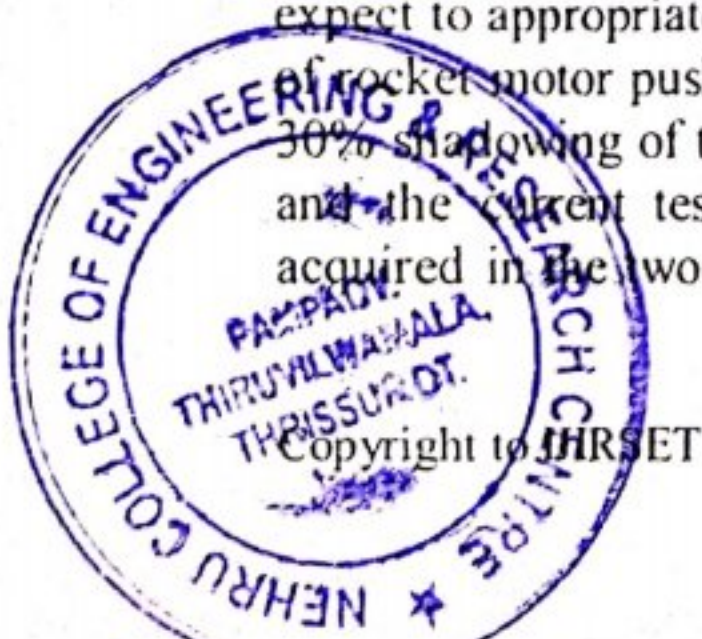
I. INTRODUCTION

Thrust Vectoring is a moderately new innovation which has been discussed for quite a while, and it can give present day military flying machine with various points of interest in regards to performance such as enhanced manoeuvrability, shorter take-off, broadened flight envelope and survivability. Furthermore, as a result of Thrust Vectoring, there is additionally the ability to independently control the exit section of the nozzle, which permits to have dependably an "adjusted" nozzle to each flight condition and motor power requirements.

A Nozzle is one of the real conduits which is utilized to quicken flow out of a progression of mach regimes. These mach regimes constitute to be Subsonic, Sonic, Supersonic and Hypersonic regions. The kind of nozzle that is decided for a specific application mostly relies upon the exit velocity of the course through nozzle and the design and working conditions. The efficiency of a nozzle incredibly impacts the general execution of the framework where it is utilized. The main applications of the nozzle mainly covers greater part of the designing, compound and restorative fields. In any case we are for the most part bothered about the outline and improvement of the channel in this way bringing about enhancing the general efficiency and limiting the work input to the framework. nozzles are mostly used to control the speed and rate of the stream alongside the direction and the pressure of the stream that rises up out of them.

II. RELATED WORK

Olivera Kostic, Zoran Stefanovic^[1] studied, a CFD (Computational Fluid Dynamics) computational model, with the expect to appropriately re-enact complex supersonic stream produced by a 2D united disparate spout. With the end goal of rocket motor push vector control (TVC) recreations, at first a few stream tab positions were utilized to create up to 30% shadowing of the spout exit, without and with a hole amongst tab and exit. Numerical outcomes were contrasted and the current test information, both quantitatively and subjectively, and reasonable understandings have been acquired in the two detects. The same CFD settings have then been connected for the computational examination of



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Design and Development for Exhaust Back Pressure Reduction with Noise Control for Motorcycles

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I. INTRODUCTION

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II. RELATED WORK

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Computer Aided Detection Scheme To Improve The Prognosis Assessment Of Early Stage Lung Cancer Patients

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Abstract - To develop a computer aided detection scheme to predict the stage I non-small cell lung cancer recurrence risk in lung cancer patients after surgery. By using chest computed tomography images; that taken before surgery, this system automatically segment the tumor that seen on CT images and extract the tumor related morphological and texture-based image features. We trained a Naive Bayesian network classifier using six image features and an ANN classifier using two genomic biomarkers, these biomarkers are protein expression of the excision repair cross-complementing 1 gene (ERCC1) & a regulatory subunit of ribonucleotide reductase (RRM1) to predict the cancer recurrence risk, respectively. We developed a new approach that has a high potential to assist doctors in more effectively managing first stage NSCLC patients to reduce the cancer recurrence risk.

Key Words: computer-aided diagnosis, lung tumor segmentation, image features analysis, fusion of image features and genomic biomarkers, prediction of lung cancer recurrence risk.

1.INTRODUCTION

LUNG cancer is the second most commonly diagnosed cancer in both men and women. An estimated 222,500 new cases of lung cancer will be diagnosed in 2017, accounting for about 25% of all cancer diagnoses. It is the leading cause of cancer death in both men and women. With an estimate of 155,870 death in 2017, it will account for 1 in 4 cancer deaths. Over 85% of the lung cancers are non-small cell lung cancer (NSCLC). Based on the type, stage, and molecular characteristics of the cancer, treatment can include surgery, radiation therapy, chemotherapy, immunotherapy, and/or targeted therapy. For early stage non-small cell lung cancers, surgery is the usually the treatment of choice and advanced stages of non-small cell lung cancer patients are usually treated with chemotherapy, targeted drugs or Immunotherapy [1].

Lung cancer shows the highest mortality rate especially in men due to the over tobacco usage [2]. Even though early stage cancer detection and appropriate treatment can improve the survival rate of lung cancer patients, lung cancer recurrence rates after surgery of the malignant lung tumor can be from 30% to 60% is reported in the earlier studies [3]. Lung cancer mortality rate among the stage I NSCLC patients is much higher than many other types of detected in an early stage. The most recent rates published for the current AJCC staging system are the 5-year survival for the people with stage 1A1 NSCLC is about 92%, for

people with stage 1A2 NSCLC is about 83%, for people with stage 1A3 NSCLC is about 77% and also the 5-year survival rate for people with stage 1B NSCLC is about 68% [4]. Therefore, in order to more effectively treat and manage the stage I NSCLC patients, it is important to develop an proper prediction model to more accurately predict cancer prognosis after cancer surgery. Since there is no clinical standard for assessing the risk of cancer recurrence after surgery, researchers have tested with different genomic biomarkers to identify the different genomic defects in lung cancer development and prognosis [5]. Among them, two biomarkers, ERCC1 gene and RRM1, have been extensively investigated and reported as prognostic biomarkers of the NSCLC patients [6]-[7]. Many advanced imaging methods such as high-resolution CT, positron emission tomography (PET), PET-CT, and magnetic resonance imaging (MRI) have been used in lung cancer imaging. Among them, CT remains the most popular imaging method due to its higher accuracy, wide accessibility, and cost effectiveness.

In this study, we developed a new quantitative image feature analysis method to predict the risk of lung cancer recurrence of the stage I NSCLC patients after lung cancer surgery. For this purpose, we developed a new computer-aided detection (CAD) scheme to automatically segment lung tumors depicting on CT images acquired before surgery and compute tumor-related morphological and texture-based image features. Using a set of the selected image features, we trained a Naive Bayes classifier to predict the risk of cancer recurrence of the stage I NSCLC patients after surgical treatment. We also trained a classifier to combine two genomic biomarkers (ERCC1 and RRM1). finally applying a fusion method to combine both result from 2 classifiers and predict the cancer recurrence risk.

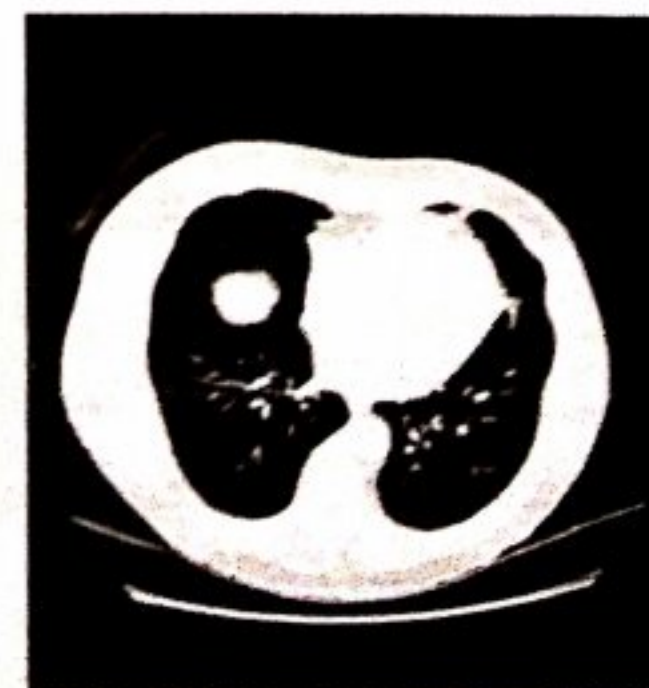
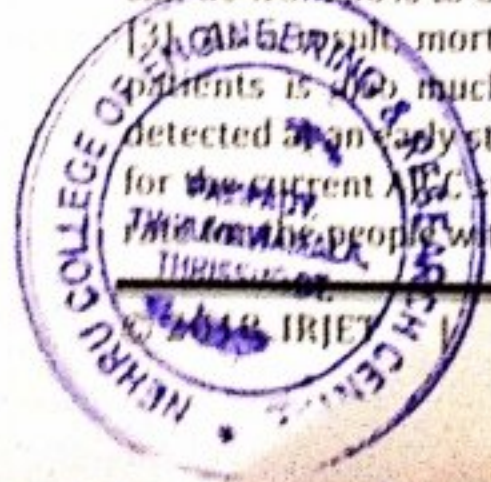


Fig -1: CT image of one patient



Faster RCNN for Concurrent Pedestrian and Cyclist Detection

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Abstract

Pedestrian and cyclist detection systems are increasing attention with the development of autonomous automobiles and robotics. Many researches have been done for protecting vulnerable road users particularly pedestrians and cyclists. Little effort has been made to detect the pedestrian and cyclist concurrently. Here we are using a method called UB-MPR-Upper Body Multiple Potential Region to detect them concurrently. For the classification and localization, we are using faster RCNN network. Experimental results indicate that the faster RCNN method outperforms the already existing fast RCNN method.

Keywords— faster RCNN; fast RCNN; pedestrian; cyclist detection; upperbody detection

I. INTRODUCTION

Over the past decade, many researches has been made on improving driving safety. One of the important task in intelligent transport system is pedestrian and cyclist detection. Half of the world's road traffic deaths occur among vulnerable road users (VRU)[1]. Vulnerable road users include pedestrians, cyclists, motor cyclists. Pedestrians and cyclists are more vulnerable to accidents as there is no special protection device for them. Therefore, more attention is given to cyclist and pedestrians.

Pedestrians and cyclists are involved in different situations of the real life. Some of the applications are: vehicle automation, surveillance, robotics and many others. However, some problems exist in their detection as in a real life scenario pedestrians and cyclists are involved in different activities, which will create variations in clothing, size, poses, occlusion etc., as shown in Fig 1.

Pedestrian and cyclist detection has been extensively studied as an application in Automatic Driving Assistance Systems (ADAS) during the last decade. Companies are currently trying to develop intelligent vehicles, which are able to get information of their surrounding through the use of various sensors, as shown in Fig. 2.



Fig. 1. Pedestrians and Cyclists

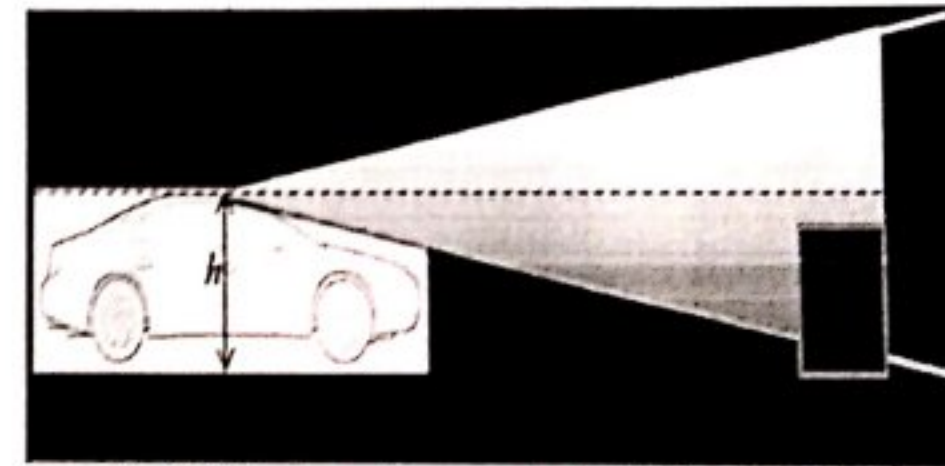


Fig. 2. The use of sensors in intelligent vehicles

Many approaches based on different such as monocular camera, stereo camera, lidar and radar are employed in vehicle environment perception systems. But for pedestrian and cyclist detection, vision sensors are the best as it can capture a high-resolution perspective view of the scene with useful color and texture information. Furthermore, vision technology is cost effective.

Traditional pedestrian or cyclist detection methods always consider pedestrians and cyclists separately [3], [4], although pedestrians and cyclists often appear in one picture. It causes confused detection results as input image has to be scanned several times. Therefore, detecting pedestrians and cyclists concurrently and differentiating them clearly is needed for the proper working of ADAS and autonomous vehicles

II. RELATED WORKS

Earlier pedestrian and cyclist detection are based on the use of feature information, commonly

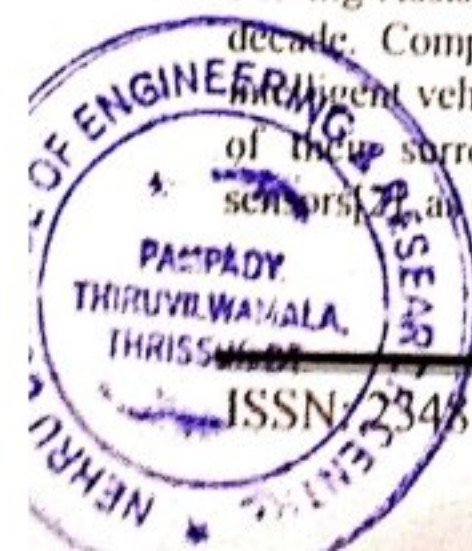
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Image Defogging and Contrast Enhancement

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Abstract: The importance of image processing is increasing day by day. Image defogging and contrast enhancement is an important area in image processing. Haze is a natural phenomenon and has turned into noteworthy issue in a large portion of the low temperature regions. Images captured in hazy atmosphere is often degraded in terms of low contrast and faded colors, this influences the working of most of the applications such as object detection, CCTV camera, driverless cars, and many more. We can tackle this problem by proposing a defogging algorithm for removal of fog from hazy images. However, the effect of fog will reduce the contrast of the images, so it is clear that removing the fog alone won't give a quality image and for this reason we introduce an algorithm which will first remove the fog and after will increase the contrast of the image which provides a better quality image. Here we use Gaussian based dark channel technique and fusion based transmission estimation for defogging and intrinsic image decomposition for contrast enhancement.

Keywords: Defogging, contrast enhancement, Gaussian based dark channel technique, fusion based transmission estimation, intrinsic image decomposition

I. INTRODUCTION

The images captured using camera in poor weather conditions such as fog or haze gets degraded in terms of low contrast and faded colors. The solution to this problem is to develop an algorithm for removing fog from these images. The existing methods focus on over all contrast enhancement of images and even removal of fog without quality contrast enhancement. Here we propose a method which initially removes the fog and then the haze free image is given as input to the contrast enhancement algorithm so that we get a better quality image with effective fog removal and contrast enhancement. The defogging algorithm uses Gaussian based dark channel technique to calculate the atmospheric light and the fusion based transmission estimation technique to estimate the transparency function. After the restoration the haze free image is contrast enhanced using the intrinsic image decomposition method. The combination of defogging and contrast enhancement algorithm provides a better quality image.

II. LITERATURE SURVEY

Research on defogging and contrast enhancement has been conducted by many researchers and has proposed different algorithms. Traditionally overall contrast enhancement were done for the removal of fog but this does not give the quality results. Then came the defogging algorithm using single and multiple images as input. However, the usage of multiple images proved computationally complex and takes more processing time than single image defogging technique. The method presented in [7] focused on the restoration of scene contrast and colors through user interactions which is capable of good restoration but it uses multiple images as input that increases complexity in computation and has limited practical applications. He et al [2] used the dark channel prior information to estimate the depth of the scene and atmospheric light and used alpha matting technique was used to refine the transmission map but this usage increases the complexity of the image processing. Jing Ming Guo et al [3] proposed an efficient defogging technique based on fusion map but do not give a good quality contrast enhanced image. To increase the contrast of the defogged image we have to impose efficient contrast enhancement technique to the defogging algorithm. Contrast enhancement algorithm basically are of two types retinex based and histogram equalization based methods. Histogram [6] based method modify the histogram distributions [12] by flattening the histogram and stretching the dynamic range of the intensity levels. This method is simple and effective but might result in over/under enhancement of images. Whereas the retinex based method assumes the scene in human eye as product of reflectance and illumination layer. [8] Proposed retinex based method which decomposed illumination and reflectance layer and adjusted the reflectance layer for contrast enhancement but this destroys the naturalness of the image. Intrinsic image decomposition was first proposed by H.

Barrow et al [4] which decomposed image into reflectance and illumination layer. In this paper we proposed an effective defogging and contrast enhancement model. We combined the defogging algorithm and efficient contrast enhancing algorithm that gives good peak signal to noise ratio compared to the existing methods.



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Review on Advancements in PPG Based Heart Rate Monitoring During Physical Exercise; from Contact to Contactless

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Abstract

The important physiological indicator heart rate (HR) says a lot about the person's fitness and variation in this parameter can reveal information about their life style, stress levels or sleep quality. A study on bout of innovations and experimentations on heart rate estimation using the photoplethysmographic (PPG) signal is carried out in this paper. There are a number of signal processing algorithms that can be applied to the raw PPG signals from which we can have the heart rate measurement. But motion artifact (MA) comes into play when the subject is undergoing some type of motion and is the main factor that degrades the accuracy of this HR measurement. Most of the modern research in this area is mainly concerned on this MA reduction or attenuation to extract the actual HR. With the advance of computer and photonics technology, this contact-PPG based HR measurement could be extended to contactless imaging photoplethysmography (IPPG). So here we try to explore the concepts of all PPG based HR measurement.

Keywords: Heart rate, photoplethysmography, motion artifact, signals processing algorithms, imaging photoplethysmography.

1. INTRODUCTION

The existing method for heart rate measurement is by using ECG (electrocardiography), where it measures the spikes of the electrical activity generated in the heart by the electrical signals that control the expansion and contraction of heart chambers. But the use of ground and reference sensors in ECG that are attached to the chest makes it uncomfortable for extended periods. Even though this current HR monitoring method has a role to play in medical and exercise settings, it is not a viable means for continuous purpose and when unconstrained measurement is required. So, for users who want to take continuing HR measurements as part of their health, fitness tracking and life style monitoring, comfortable

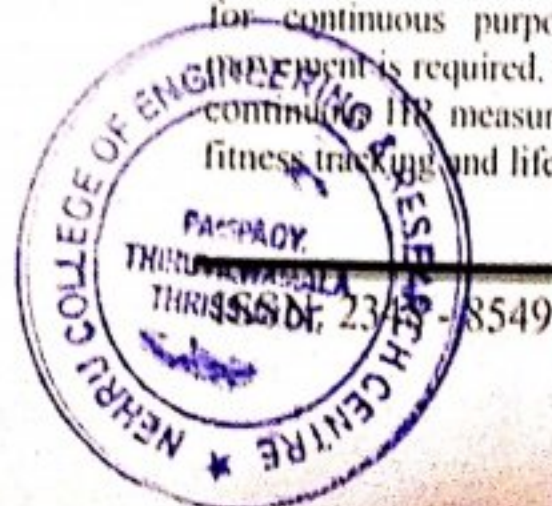
methods that can interface to a smart phone or computer is required.

Clearly the ECG is not suitable for this purpose. In fact, an alternative is already widely adopted by medical professionals for HR monitoring by measuring the changes in the volume of blood as it distends the arteries and arterioles in the subcutaneous tissue and this optical measurement method is so called photoplethysmography (PPG). And this blood volume changes in the subcutaneous tissue are synchronous with the heart rhythm. In the field of non-invasive HR measurement, optical sensors with photons as sensing elements are highly relevant. PPG based HR monitoring make use of sensors that can be attached on the peripheral positions such as fingertips, wrists or earlobes is seen as a much more comfortable solution.

The PPG sensors [1] are embedded in some wearable wrist bands or watches and it emits a beam of light into the skin and measures the changes in light intensity which is reflected or transmitted through the skin. The amount of light received at the sensor falls sharply at periodic intervals, as the increased volume of blood absorbs more of the light. The signal from the sensor is a saw tooth like curve and the periodicity of these measurements reflects the heart rhythm. Thus PPG signal provides an efficient means of HR estimation.

But PPG-based HR estimation becomes particularly challenging because of the presence of motion artifacts (MA), especially in free living conditions. MAs that are caused by body movements and sensor deformation would results inaccurate measurements, unless the system cancelled out their effect through the application a compensation algorithm. A number of methods and algorithms have been proposed to reduce the effect of MAs in PPG signals.

Due to advancements in the field of microelectronics, photonics, and image processing technologies, the past decades have witnessed grand



Automatic Classification of Images from WCE Videos based on SURF and Locality Constrained Linear Coding

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Abstract—Wireless Capsule Endoscopy (WCE) has become a mostly used diagnostic technique for the gastrointestinal tract at the cost of a huge quantity of data that wants to be analysed. To find a solution to this problem a new computer aided system using novel features is proposed in this paper to classify images from WCE videos automatically. In the feature learning stage to obtain the representative visual words, the training images of polyp, ulcer, bleeding, and normal images are sampled and represented by Speeded up Robust Features (SURF) descriptor, and is constructed by K-means clustering algorithm. These four types of visual words are combined to composite the representative visual words for classifying the WCE images. In the feature coding stage we propose a locality constrained linear coding (LLC) algorithm to encode the images. LLC uses the locality constraints to project each descriptor into its local-coordinate system, and the projected coordinates are concatenated by max pooling to create the final representation, and classified using SVM. The experimental results exhibit a higher accuracy, sensitivity, specificity and lower processing time, validates the acceptance of the proposed method.

Keywords: SURF (Speeded Up Robust Feature), Wireless Capsule Endoscopy (WCE) image classification, Locality Constrained Linear Coding (LLC) algorithm, Coding bases.

I. INTRODUCTION

WIRELESS CAPSULE ENDOSCOPY (WCE) [1][Fig. 1(a)] which was first invented by Given Imaging Incorporation in 2000 and it involves transmission of images wirelessly from the inner sides of intestinal tract to the outside environment.

WCE has been adopted instead of the traditional ones it makes possible, painless, non-invasive, disposable [2] and effective diagnostic technique which lowers the amount of discomfort and can be indulged by the patients for the observation of small bowel [3], [4]. A normal WCE capsule measures 11 mm in diameter and 25 mm in length. WCE system which is a pill-shaped device that contains a tiny camera, light sources, a battery, radio transmitter and some other miniaturized element. After a WCE is consumed by a patient it passes through the gastrointestinal (GI) tract and starts to capture color images of the tract for an average period of 8 hrs. Simultaneously these images are then sent wirelessly to a data-recorder attached to the patient's waist and the small device is propelled through peristalsis. At last the physicians review the images that are downloaded to a computer, and diagnose various abnormalities in the gastrointestinal tract [5], [6]. An experienced clinician spends an average of 2 hours for the video reviewing and analysing of approximately 60,000 images that are captured per examination of one patient [7]. Therefore, it is essential to design a computer-aided diagnosis system for processing WCE images to assist the physicians to analyse abnormal images.

II. RELATED WORK

Many works have been made in the literature for automatic abnormal image detection from the WCE videos [8]-[14]. The common diseases in the intestinal tract are typically bleeding, polyp, and ulcer, as shown in Fig. 1(b)-(d). Yeh et al. proposed [8] a novel method for detecting bleeding and ulcers in WCE images by using color features to determine the status of the small intestine. Fu et al. [9] introduced rapid bleeding detection in the WCE videos. They segmented images through



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Pre-Denoising, Deblurring and Ringing Artifacts Removal of Natural, Text and Grayscale Images

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Abstract – we introducing simple yet effective method for image denoising, deblurring removal of ringing artifacts. The three processes mentioned above is done in the order they mentioned. The denoising removes the salt and pepper noise, while deblurring removes the blur. After the deblurring the ringing artifacts are removed. Denoising is done by the method of total variation minimization. There is no need of any edge selection methods for the deblurring. Deblurring done here is a prior based one. The intensity and gradient prior with regularization makes the deblurring clear and perfect. Artifact removal makes the image clearer

Key Words: image denoising, deblurring, ringing artifacts, salt and pepper noise, edge selection methods, intensity and gradient prior

1. INTRODUCTION

The images captured right away from the sources are not usually ready for further use. The raw image is needed the processing before the use. Some Image will be too much affected by the noise. The astronomical images usually affected by the salt and pepper noises. The grains we usually see in the television is due to the presence of salt and pepper noise in the frames captured. Presence of this kind of noise ruins the quality of the images and make it less clear. This kind of noises best removed by the total variation minimization. In which the total variation of image details are minimised as much as possible. It removes the unwanted details and preserve the original details. The blurring is another important problem that we can identify in the images. The camera or object motion or defocus causes the deblurring. This also effects the quality of the images. Deblurring is done with intensity and gradient prior with L_0 regularization. Ringing artifacts are the ghost like structures present in the image. This makes the image to look like double or triple layered. The Laplacian transforms are used to remove the ringing artifacts. The important of the work is coming in the field of physics and astronomy. The system works with at most accuracy and speed

2. IMAGE DENOISING

Image noise is any degradation in the image caused by any kind of external interference or other kind of disturbances. Salt and pepper noise, periodic noise, Gaussian noise, Speckle noise etc. are the usual noise encountered in the images. The salt and pepper noise is the most common noise that we can

see often. There are several methods to remove the salt and pepper noise. The best and adaptable method is selected here for the removal of the noise. This is done by analyzing four denoising methods and their algorithms, advantages and disadvantages. The method here chosen for denoising is total variation minimization. The other methods and their disadvantages are tabulated below.

Table -1: Methods for Denoising

Denoising methods		
Method f denoising	Advantages	Disadvantages
Gaussian Filtering	Optimal for flat part of images	Edges and text are blurred
Anisotropic Filtering	Straight parts of images are restored	Flat regions are degraded
Neighboring Filtering	Non-local algorithm	No robust
Total variation minimization	Straight edges are maintained	Textures can be over smoothed

The total variation minimization can be used for the process of denoising because the disadvantages that we analyzed here is actually an advantage for deblurring. Smoothing of textures is a boon because the deblurring become easy in this case.

The denoising problem was effectively solved by the Stanley .H. Chan's [2] Lagrangian method of video restoration. The paper solves the Total Variation L_1 (TV/L1) problem by introducing the intermediate variables. The TV/L1 problem is further subdivided in to F- sub problem, U-sub problem- r-sub problem according to the regularization variable. Stanley's paper deals with the video information. The single frame algorithm was formulated instead of triple frame. The system well works with the actual TV/L1 probem with single frame.

3. IMAGE DEBLURRING

Image deblurring is the process that removes the distortion from any blurry images. It uses the knowledge of how optical system blurs the single point of noise. Simply the deblurring removes the blurring artifacts from the images. Causes of





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A Secure and Low Cost Range-Free Localization Algorithm for Mobile Sensor Networks

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Abstract

In these days, it is very important to trace a mobile in the vast mobile sensor network. It is mainly for identifying the location of the person who is using that mobile. For this application, the location of the mobile node (mobile) is to be found. This process is known as localization. Out of different types of localization techniques, range-free localization approaches are cost-effective for mobile sensor networks (because no additional hardware support is required). Due to economic considerations, mobile sensor networks typically have sparse anchor nodes which make most range-free localization algorithms inaccurate. On the other hand, due to the power limitation of mobile sensor nodes (i.e., they are battery-operated) and high power consumption by communication, high communication cost will significantly reduce the network life time. For solving these two problems, historical beacons (i.e., anchor nodes' announcements delivered in previous time slots) and received signal strength (RSS) are used to derive three constraints. By the aid of the three constraints, introduced a low-communication-cost range-free localization algorithm (only one-hop beacon broadcasting is required). Also extended this project by adding a data discovery and dissemination protocol. This makes the system free from vulnerabilities.

Keywords: Localization, Anchor Nodes, Beacon, Dissemination, Cryptography

I. INTRODUCTION

Localization is a critical issue in wireless sensor networks (WSNs). Although GPS has been widely used to assist location-based services, it is impractical to equip each sensor node with a GPS device in large-scale WSNs. Therefore, localization algorithms for WSNs typically use a limited number of anchor nodes, which are aware of their locations, e.g., by the aid of GPS, while the other nodes (referred to as normal nodes) estimate their locations using the location information of anchor nodes. Such localization algorithms are anchor node-based, and they can be further divided into two categories: range-based and range-free.

A range-based localization algorithm calculates locations with absolute point-to-point distances, while a range-free localization algorithm calculates locations without these distances. However, distance estimation techniques usually require additional expensive hardware support (e.g., angle of arrival (AoA) and time difference of arrival (TDoA)), or have low accuracy (e.g., received signal strength (RSS)-based approaches). Due to the hardware limitations of WSNs, range-free solutions are being pursued as an alternative to range-based solutions. Most of prior range-free localization algorithms were designed for static sensor networks and not applicable to mobile ones. Existing range-free localization approaches for mobile sensor networks usually suffer from sparse anchor node problem and high communication cost. Due to economic considerations, wireless sensor networks typically have sparse anchor nodes which makes most range-free localization algorithms inaccurate. On the other hand, in mobile sensor networks, sensor nodes are battery-operated and communication is the highest power consumption item. Prior localization algorithms achieve the required accuracy with high communication cost and high communication cost will significantly reduce the network life time. Moreover, due to the rapid development of wireless technologies (e.g., Wi-Fi and Bluetooth) and quickly emerging applications, the ISM band, which is used by most WSNs, has become crowded and congested. Hence, localization algorithms with high communication cost will be impractical in the near future.

II. RELATED WORK

Today, smart environments are deployed everywhere, and mobile sensor networks can be used in many different scenarios. Mobile sensor networks are particularly interesting in hazardous or remote environments, or when a large number of sensor nodes have to be deployed. The localization issue is important where there is an uncertainty about some positioning. An effective localization algorithm can then use all the available information from the nodes to compute all the positions. The aim of this paper is to develop an algorithm for localization of nodes in a sensor network. The algorithm should be distributed and executed in individual nodes; schemes that pool all data from the network and perform a centralized computation will not be considered. Since the algorithm should be run in individual sensor nodes, the solution has to be relatively simple, and demand limited in terms of computation, memory and communication overhead).



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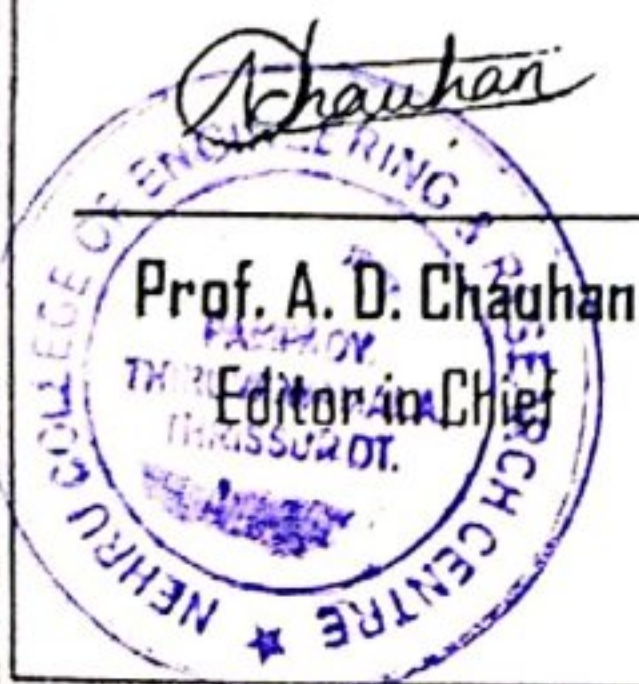
in recognition of the publication of the paper entitled

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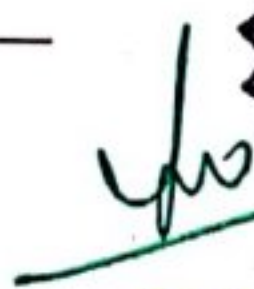
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Enhanced SWASP Algorithm for Mining Associated Patterns from Wireless Sensor Networks Dataset

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Abstract

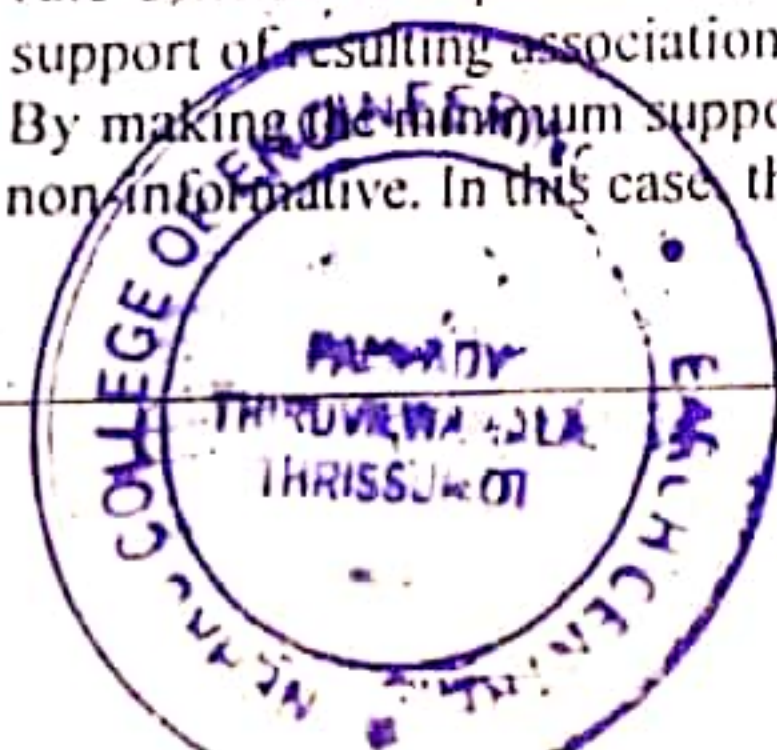
A Wireless Sensor Network are successfully deployed for various applications such as low cost area monitoring, environment monitoring, industrial and machine health monitoring, and military surveillance and they are spatially distributed autonomous sensors to monitor conditions such as physical and environmental. WSNs generate a large amount of data streams. Mining useful information from these data stream is a challenging task. Many algorithms have been proposed to extract the useful knowledge from sensor data and the widely used algorithm is Associated Sensor Pattern and compact tree structure, called Associated Sensor Pattern tree which uses pattern growth-based approach to generate all associated patterns with only one database scan over dataset. But when data stream flows through associated sensor pattern may fail to capture the significance of recent data. To overcome this limitation Associated Sensor Pattern tree is further enhanced to Sliding Window Associated Sensor Pattern tree by adopting sliding observation window and updating the tree structure accordingly and a mining algorithm Sliding Window Associated Sensor Pattern is used to mine recent associated patterns. But the limitation of Sliding Window Associated Sensor Pattern is that it takes too much time to mine associated patterns for large dataset. To enhance the performance of this algorithm, the dataset is partitioned into different sub parts and by using this partitioned dataset the Sliding Window Associated Sensor Pattern algorithm are run parallel by using multithread concept. And this enhanced algorithm reduces the total execution time and also increases the memory efficiency.

Keywords: Wireless Sensor Network, Sensor Data Stream, Behavioral Patterns, Data Mining, Knowledge Discovery

I. INTRODUCTION

Wireless Sensor Networks (WSNs) are successfully used for various application and it is a promising and interesting research area for diverse monitoring [3] and detection application such as area monitoring, waste water monitoring, health monitoring and military surveillance. WSN consists of a large number of sensor nodes which communicates through wireless media to the central sink node and cooperatively works to monitor the environment. WSN generate a large amount of data streams. Extracting such data stream from WSN presents new challenges for data mining techniques. Data mining techniques, which are well established in the traditional database systems, have recently received a great deal of attention as promising tools to extract interesting knowledge from sensor data streams and these techniques have been used to extract useful knowledge from WSN data, through discovering relationships among the sensor nodes which are known as behavioral patterns. Behavioral pattern is used to identifying missed reading events and better management of resources in a WSN. Discovering behavioral patterns from WSNs can be highly useful in applications that require a fine-grain monitoring of physical environments which may face critical situations like [8] fire, toxic gas leaks and explosion.

Using knowledge discovery in WSN one particular interest is to find behavioral patterns of sensor nodes, which are evolved from meta-data describing sensor behaviors. If events from sensors s_1 and s_2 are reported, then there is a 80 percent chance of receiving an event from sensor s_3 and s_4 within λ units of time, where 80 percent is the frequency of the rule. Generating association rules that have certain frequency needs to generate all the frequent patterns present in the data that meet a specific frequency value. The process of generating the association rules is straightforward after determining the frequent patterns. The rule scheme is dependent on a constraint termed minimum support threshold which specify minimum lower bound for the support of resulting association rules. It is possible to extract high value knowledge if the minimum support threshold is set high. By making the minimum support threshold low, an extremely large number of association rules are generated, most of which are non-informative. In this case, the valid correlation in the data objects gets covered among a huge pile of pointless rules.



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Enhanced SWASP Algorithm for Mining Associated Patterns from Wireless Sensor Networks Dataset

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Abstract

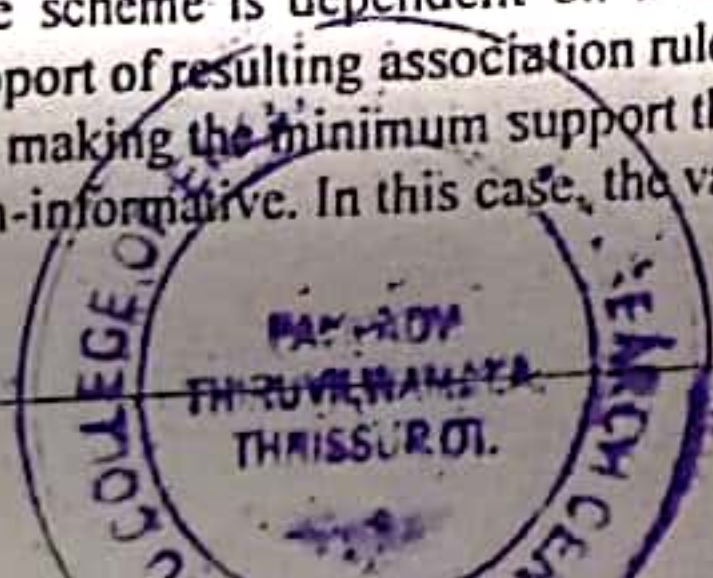
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Users Activity based Recommendation Systems and Efficient Data Sharing in Social Networking Services

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Abstract

Online social networking sites like, Facebook, Google and Twitter are suggested to share their public and personal information and make social relationship or connection with individual or people who can be even strangers. Existing social networking facilities recommends friends to users based on their social graphs, which might not be suitable to reflect a user's preferences on friend selection in their real life. In this system, human interest based friend recommendation system for social networks, which recommends friends to users based on his/her life styles instead of their social graphs and determine life styles of users from user-centric sensor data and measures the comparison of life styles between users and this scheme recommends friends to users if their way of lifestyle has high similarity. Social networking sites also include sharing of files or data among the users or group of users. Data sharing is not easier and an accurate analysis on the shared data provides more benefits to both the society and individuals. Data sharing with a large number of participants must take into account many issues, that is efficiency, data integrity and privacy of data owner. Also ranking is done based on searching of users profile information. Finally, this system also take part a feedback mechanism to improve the users satisfaction and recommendation accuracy.

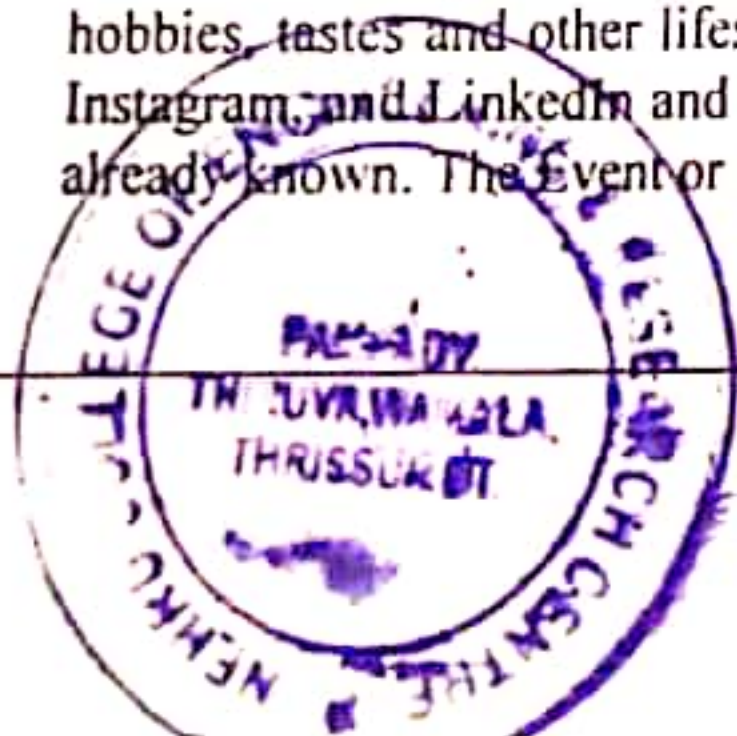
Keywords: Activity Recognition, Lifestyle Modeling, Recommendation System, SNS

I. INTRODUCTION

Twenty years ago, people typically made friends with others who live or work close to themselves, such as neighbors or colleagues. We call friends made through this traditional fashion as G-friends, which stands for geographical location-based friends because they are influenced by the geographical distances between each other. With the rapid advances in social networks, services such as Facebook, Twitter and Google+ have provided us revolutionary ways of making friends. According to Facebook statistics, a user has an average of 130 friends, perhaps larger than any other time in history. One challenge with existing social networking services is how to recommend a good friend to a user. Most of them rely on pre-existing user relationships to pick friend candidates. For example, Facebook relies on a social link analysis among those who already share common friends and recommends symmetrical users as potential friends. Unfortunately, this approach may not be the most appropriate based on recent sociology findings. The main areas of research in this field are:

A. Social Networking Sites

A social networking service or site(SNS) is a large dais to build social networks or relationship among individuals who share their related interests, surroundings of users or real-life connections. Social networking sites are web based services that allow individuals or users to generate a public profile, creating a list of users with whom to share their connections. Social network have become an unlimited resource of knowledge or information, for that there are several applications have been proposed to mine the information from social networks such as recommender system. The expansion of the social networks from the Internet created a major improvement in knowledge growth. From facts to search and then search to social interaction, users around the world are now greatly involved with the Internet as user generated content undertakes perceptual growth and expansion. Today's social networking services are popular means to make contact or exchange ideas with people or persons around the world. These social networking sites behave like an online circle. Many of these online community members share their common classes in hobbies, tastes and other lifestyles. Some of the similar and popular social networking services are Facebook, Twitter, Google, Instagram, and LinkedIn and so on. The current systems assembled together the people on the basis of hobbies and people they already known. The Event or Group Based Friend Recommending System for Social Network is based on user's activities.




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Secure and Privacy Preserving Message Authentication with Chameleon Hashing using Proxy Vehicles in VANETS

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Abstract

Several services and applications are there in daily life which requires preserving privacy and data security in communications. In Vehicular Ad-hoc Networks to improve the driving comfort and safety of information, the messages are broadcasted regularly. Because of broadcasting of messages without the security and privacy guarantees, the messages can be easily retrieved by the third party. Only the certificate authority should be able to recover vehicle's real identity when the vehicles are in a dispute event. To overcome this issue chameleon hashing based privacy preserving method is used. This scheme uses an elliptic curve based light weight privacy preserving protocol that exploits dynamic public keys to improve the security and efficiency of VANET communications. Although it is one of the best schemes, it fails to deal with certain issues. One of the main disadvantages is that it is difficult for a single Road Side Unit (RSU) to verify each vehicle's signature sequentially when a large number of vehicles emerge under the coverage area of an RSU. To reduce this computational difficulty, the proposed scheme uses proxy vehicles which are acting as an intermediate between RSU and vehicles. Proxy vehicles are used to authenticate multiple messages from the requested users using a verification function at the same time. The proposed system improves the total security of the existing system by adding separate secure and private authentication on messages so that the third party cannot access the messages and modify it.

Keywords: Elliptic Curve Based Chameleon Hashing, Privacy Preservation, Proxy Authentication, Proxy Vehicle, Security and Privacy, Vehicular Ad-Hoc Networks

I. INTRODUCTION

Numbers of techniques are there in VEHICULAR AD-HOC network which make the comfort and safety of vehicles and for the drivers also. VANET encloses the communication between different entities such as RSU, known as which is capable of exchanging information or certain messages between OBU (On Board Unit normally inside vehicles). Other than RSU's and OBU's, a Certificate Authority (CA) which is capable of handover the certificates for the units which are in transmission of messages. VANET communication empowers vehicles in an unprecedented way. V2R enables the vehicle to become itself a source of traffic information. Most of the research work in the symmetric cryptography area was for security in networks. It deals with the chameleon hashing scheme using Elliptic curve cryptography. Fig (1) shows the entities in a vehicular ad-hoc network. Main classification of VANET will be in to three groups such as Vehicles, Road Sid Unit and Authorities. Vehicles are capable in transmission of messages depending up on each user's interest. It will also check the data that are received from each vehicle or road side unit and verifies those messages to prove trustworthy of data.

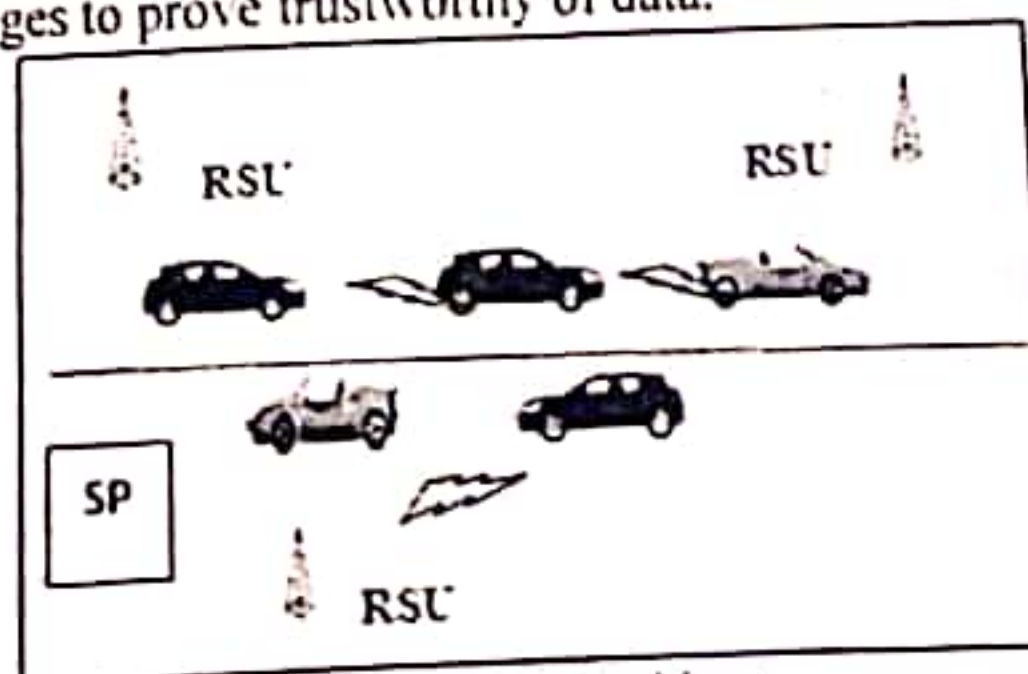


Fig. 1: VANET Architecture



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Secure and Privacy Preserving Message Authentication with Chameleon Hashing using Proxy Vehicles in VANETS

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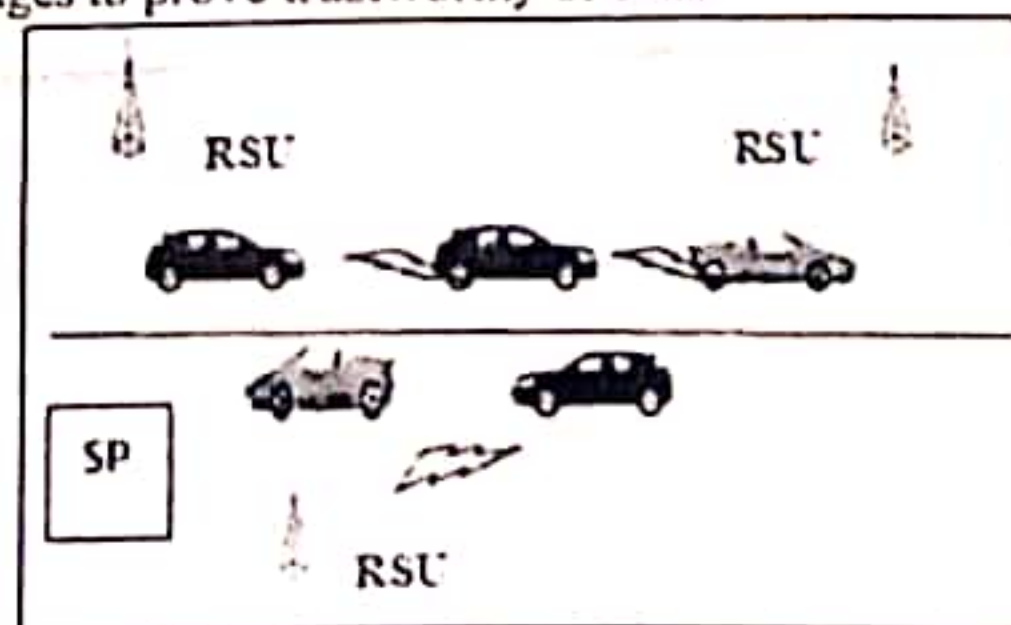
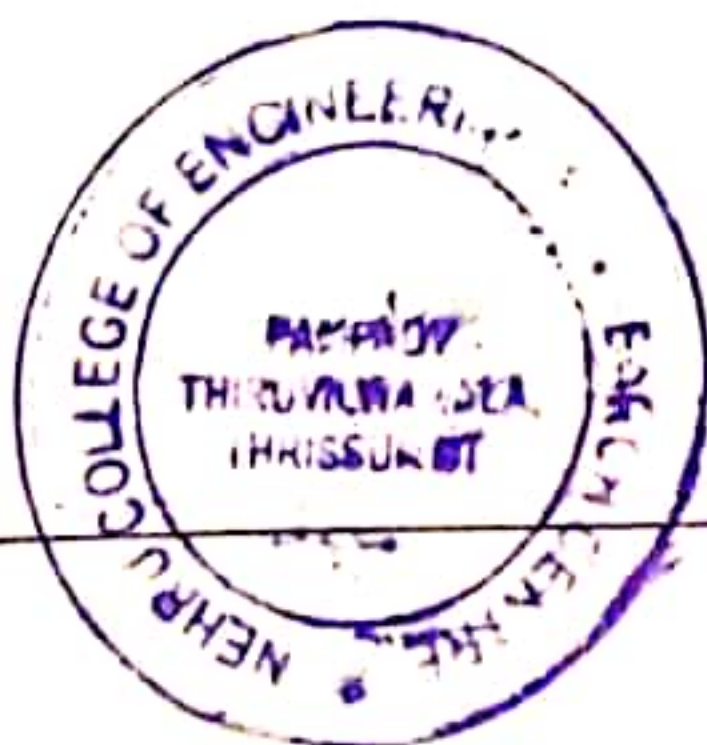



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Enhancement in Boosting Efficiency via Feature Selection and Clustering of Input Dataset

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Abstract

Learning is an inevitable aspect in the field of Artificial Intelligence. Supervised learning systems are of great importance in current era. Boosting is an iterative technique for improving the predictive accuracy of such systems. It works by learning multiple functions by considering the output label of previous function as the base of succeeding one. Real world data sets still have issues while dealing with label noise and over fitting in case of complex datasets. To mitigate this issue the datasets are being clustered together using efficient algorithms. The dataset is being grouped together by combining the most similar member data. This clustered data set is then integrated together to the boosting process. Thus it improves predictive accuracy and lessens over fitting. This work first analyses the variation in predictive accuracy of popular boosting techniques with clustered and non-clustered data sets. After the analysis, a feature selection based approach is proposed to mitigate the identified issues is proposed which can enhance the efficiency of the system in the aspects of both time and memory.

Keywords: Artificial Intelligence Clustering Algorithms, Label Noise, Supervised Learning Systems

I. INTRODUCTION

Machine learning is a prominent domain of computer science which includes different types on the basis of nature of learning. Supervised, unsupervised, reinforced are the major categorizations. Supervised Learning systems are continuously monitored to ensure the accuracy and efficiency. Therefore accuracy prediction is also an important aspect of Supervised Learning Systems. Boosting is an iterative process capable of improving the predictive accuracy. Subsequent functions in boosting technique solely rely on the values generated by previous functions. Each of these function predicts the succeeding data instances using a weighted vote. A more refined decision boundary on the training data can thus be obtained by combining multiple functions together. This seems to be more efficient than in cases where only a single function is used.

Even though boosting has a wide range of advantages, it still has limitations. It fall short in the scenarios where the labels of instances provided are wrong in actual sense and in cases where irrelevant features exist in training data set. It also faces issues in cases where over fitting of training data occur due to existence of complex and long functions.

These common issues are mitigated by incorporating clustered dataset as input for boosting. This can augment the way in which boosting learns functions [1]. This paper first analyses the variation in predictive accuracy in clustered and non-clustered data sets. Then it proposes a feature selection based approach for selecting only relevant data points and helps to improve the predictive accuracy by maintaining or improving the time and memory efficiency of clustered boosting approach.

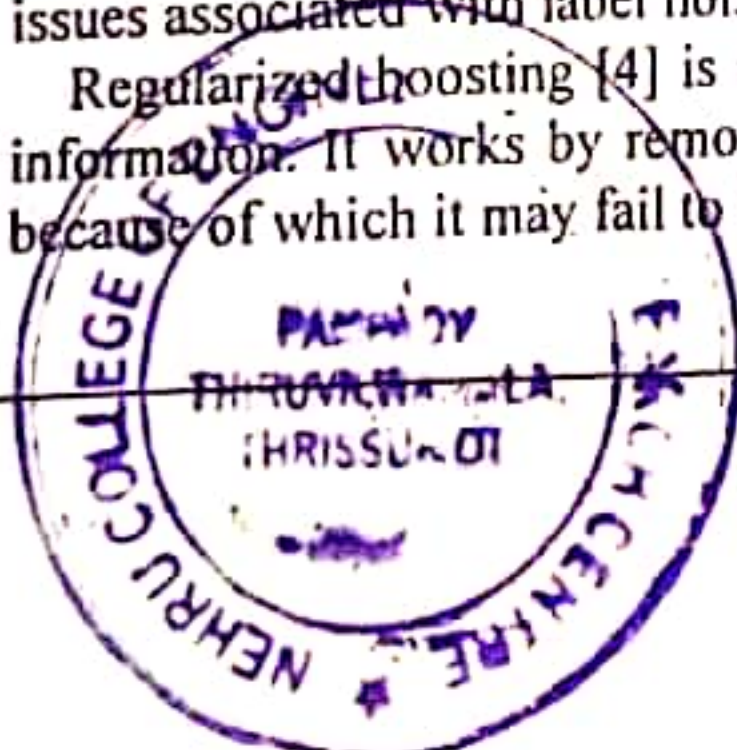
II. RELATED WORK

Boosting is done by two different methods: either by resampling and by reweighting. Both these methods exhibit similarity in mode of execution: the probability increases for incorrect instances while it decreases for correct instances.

There are different ways by which boosting and clustering are used together in supervised learning systems. Boosting is used to bump up the efficiency of clustering by predicting the accuracy. Both clustering and boosting can be used together to augment the competence of supervised learning systems and finally clustering can be utilized to perk up boosting technique.

Certain works employ boosting and clustering to improve the splitting points for decision trees [5]. Generally the combination of clustering and boosting together use k-means algorithm for creating clusters [6]. Such applications focus mainly on mitigating issues associated with label noises.

Regularized boosting [4] is a popular cluster based boosting approach which regularizes the margin or any such additional information. It works by removing instances prone to be noisy. However it works on all the training data without clustering because of which it may fail to identify troublesome areas.



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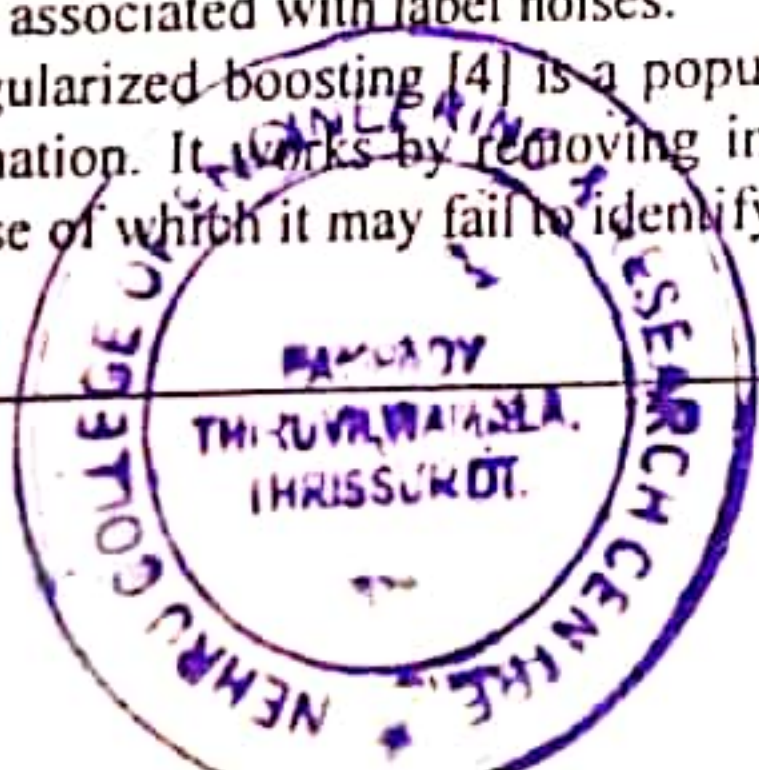
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Improved Cardinality Estimation using Entity Resolution in Crowdsourced Data

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Abstract

Crowdsourcing platforms adopt the new Labour as a Service model and allow for easy distribution of small tasks to a large number of workers. Crowdsourced systems introduce the open world model of databases. In the open world model, the database is considered to be incomplete and data needs to be collected in real time. For enumeration queries, the cardinality estimation of crowd collected data determines the query progress monitoring. A statistical tool is proposed to estimate the cardinality which enables users to judge the query completeness of crowdsourced data. Moreover, the crowdsourced database contains the records representing the same real world entity. A hybrid human-machine approach is proposed in which machines first, coarse pass over all the collected data, and crowd workers verifies only the most likely matching pairs. The entity resolution merges the duplicate records and hence can improve the cardinality estimation.

Keywords: Cardinality Estimation, Entity Resolution, Hybrid Human Machine, Crowdsourced Data

I. INTRODUCTION

Crowdsourcing was introduced which allows programmers to encompass "human computation" as a fundamental unit in algorithms that cannot be fully programmed. Humans can accomplish many tasks with ease that remains difficult or impractical for computers. Human computation makes use of human abilities to accomplish computation tasks that are complex for computers to process. Crowdsourcing is a Web based collaboration model in which tasks are outsourced to an anonymous workforce [3]. Jeff Howe coined the term "crowdsourcing" in 2006 [4].

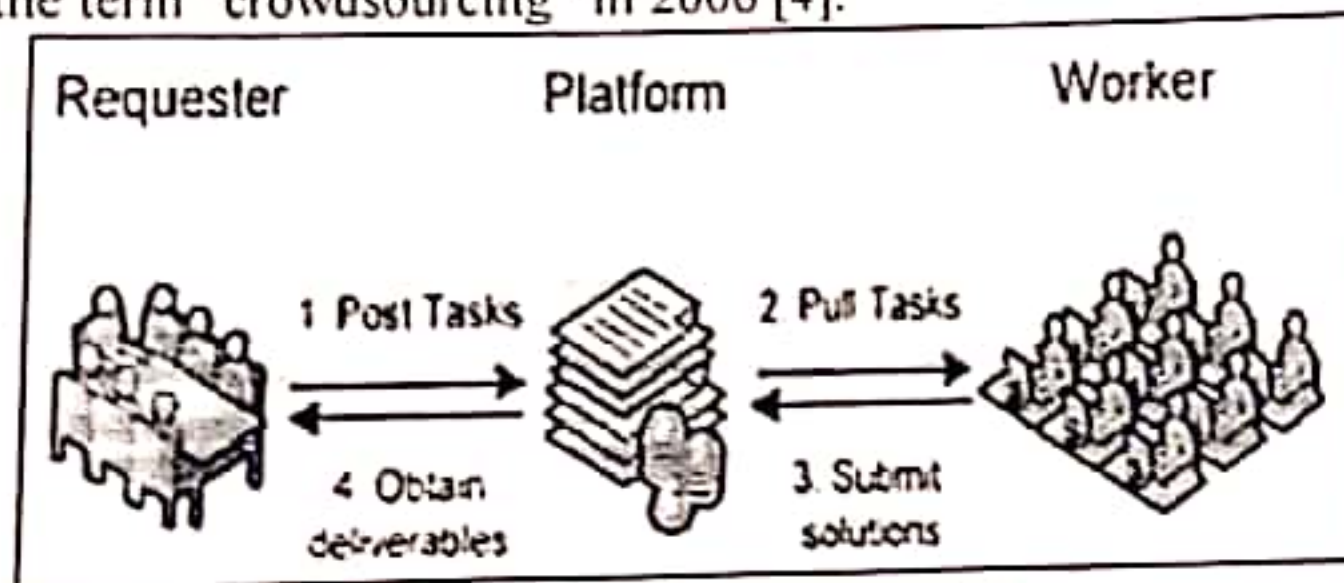


Fig. 1: Actors in crowdsourcing

Fig.1 illustrates a typical crowdsourcing scenario. To crowdsource a task, the task owner, also known as requester, submits the task to a crowdsourcing platform. Workers are people who can perform the task, can choose to work on it and devise solutions. Workers then submit these accomplished tasks to the requester via the crowdsourcing platform. The requester evaluates the posted contributions' quality and might pay workers for their contributions which have been accepted. This payment can be monetary, material, psychological, and so on [5].

In the Open world model of databases, all of the tuples relevant to a query are not assumed to be in the database a priori, hence needs to be retrieved in real time. For these types of queries human input is required for query processing. Crowds can be incorporated for set enumeration tasks. Estimating the cardinality of crowd based data is a major issue. The cardinality estimation for enumeration queries is analogous to species estimation in biology. Hence efficient species estimation techniques are adopted for the cardinality estimation [1].

A real world entity can be represented by distinct records in a database. Entity Resolution (ER) is the process of identifying and merging records that correspond to the same real-world entity. Often, people are better than a machine at deciding if records correspond to the same entity. A hybrid human machine approach based entity resolution can be to identify and merge duplicate records [2].

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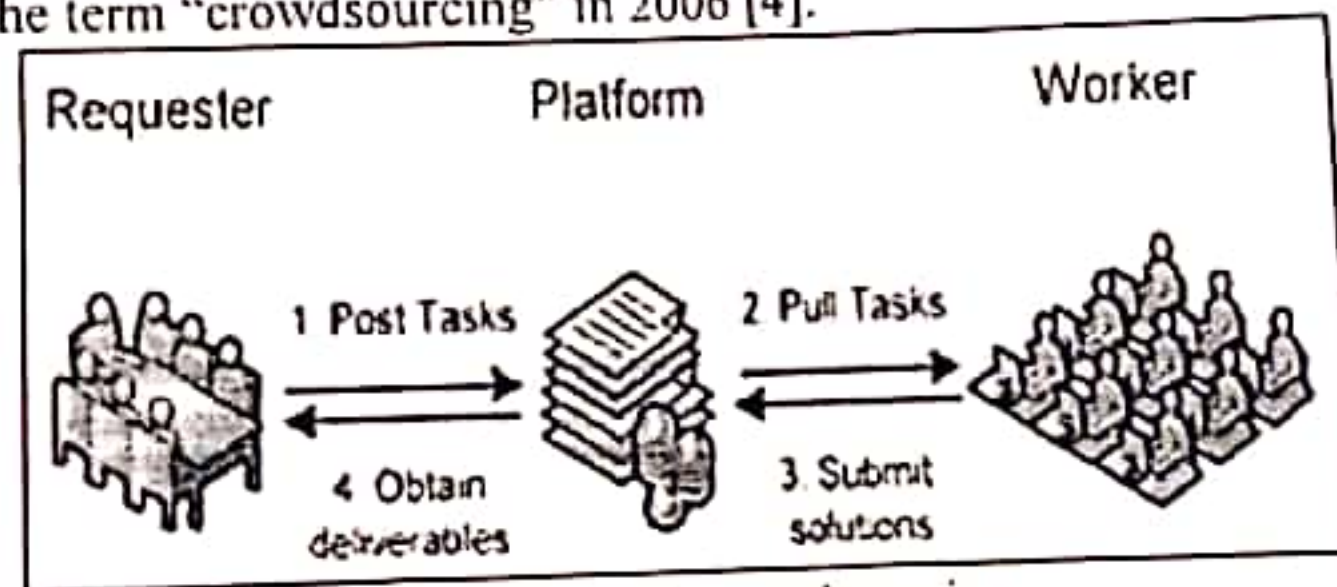
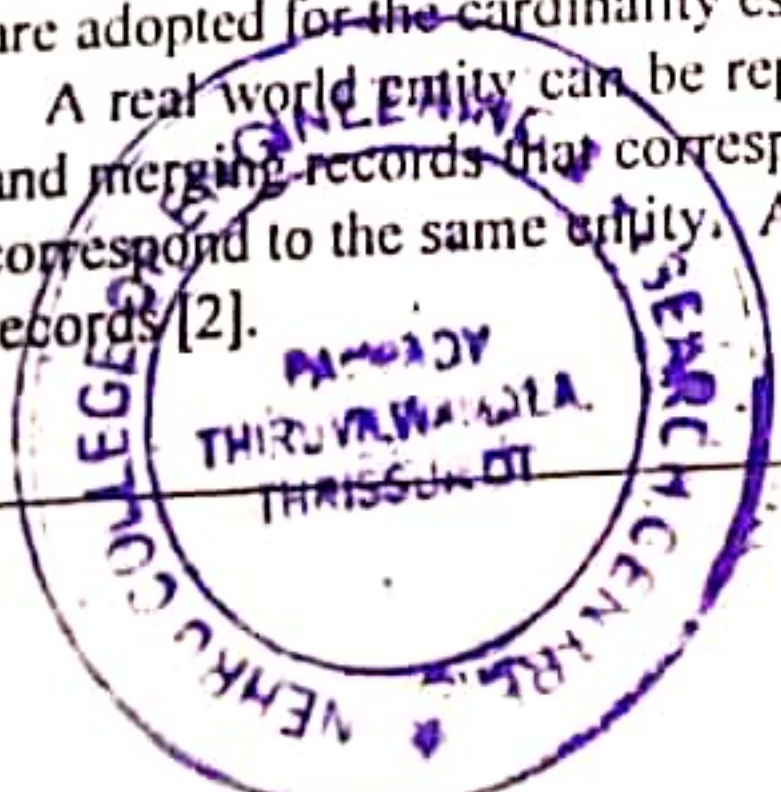


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An Efficient Reversible Watermarking Technique for Textual Data

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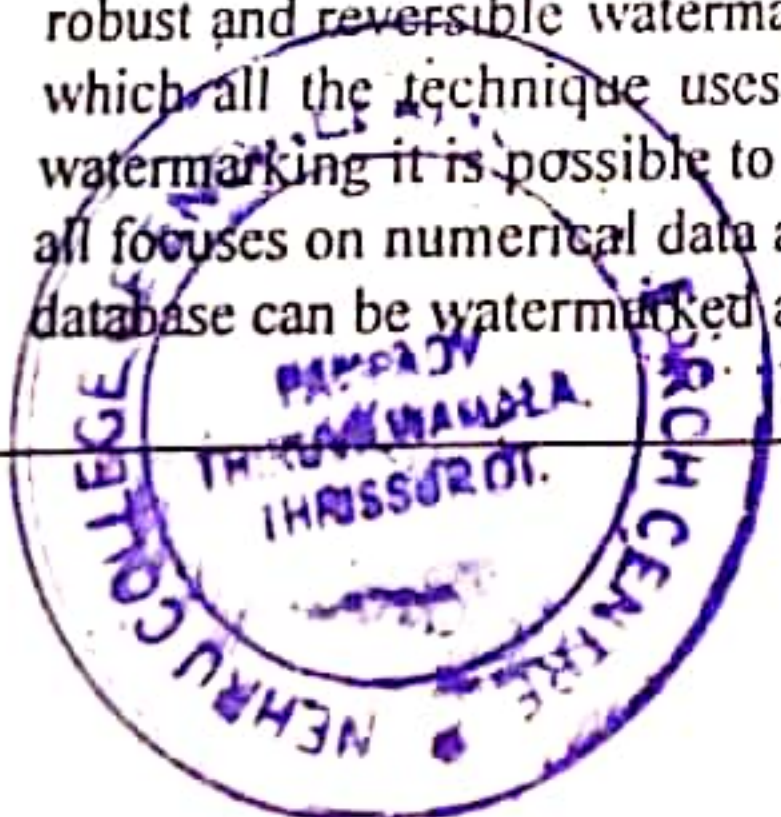
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Database is a collection of large set of data and information which are organized so that it can be accessed efficiently for knowledge discovery. Many real world applications uses open databases which are available in the internet to extract information based on their needs. The relational databases which are freely available are used by research community for mining new information regarding to their research works. These databases are vulnerable to security issues related to ownership and data tampering. The reliability of the data source must be verified before using it for any research or application purpose. In order to ensure ownership and reliability, watermarking is done to the data. When watermark is embedded to the database it reduces the quality of the data thereby making it unfit for information retrieval. In order to avoid this scenario reversible watermarking is deployed which preserves data quality by recovering the original data along with data security. There are many effective approaches that performs reversible watermarking to ensure ownership along with data recovery. But the main problems with these techniques are, they only focus on numerical databases. Due to this, many of the databases which contain textual data cannot be watermarked with the existing approaches. In order to watermark the textual database an efficient method is proposed here, that uses the Unicode and ASCII value of the alphabets to watermark the textual data. It encodes the textual data with numeric values but retrieves the original textual data at the receiving end. Since a numerical value replaces the textual data field during transmission it makes it difficult for the attacker to retrieve the original information held in the database. An Efficient Reversible Watermarking Technique for Textual Data

Keywords: Reversible watermarking, genetic algorithm, relational data, Textual data

I. INTRODUCTION

The advancement of information technology has boosted the growth of business and research. In many fields, data are extracted widely from various sources for information retrieval and decision making. Many real world application mine data available in different formats like text, audio, video, images and relational data to gather new ideas and information. Especially relational data which is more prominent among the scholar community is shared extensively by the researchers. Open databases are surplus in the internet which helps the scholars to refer different sources. However these databases are viable to many attacks. The data are illegally copied by the attackers thereby posing threat to its ownership rights. The personal information of customer is also retrieved by the attacker causing major security issue for the data. In order to resolve these issues, and to enforce ownership to data, watermarking technique is being used for many years which effectively denies illegal copyrighting. The watermark generated will be embedded to the original data which helps to identify the ownership of data. The data owner can easily identify their data if it contains a unique watermark. The issue regarding watermark is that, while embedding the watermark to the data, the database undergoes certain modification based on the bandwidth of the watermark causing the quality to be compromised. To resolve this scenario reversible watermarking technique is introduced in which the embedded watermark can be revised by the data owner and the original data can be decoded from the watermarked data thereby the data quality is kept intact. Moreover in reversible watermarking the data owner can specify the distortion tolerance i.e. the amount of change in the data that can be allowed by owner while embedding watermark. Based on the distortion tolerance the watermark is embedded to the data. The Differential Expansion Watermarking (DEW), Genetic algorithm based on difference expansion watermarking (GADEW), A robust and reversible watermarking technique for relation data (RRW) are the main reversible watermarking approaches used in which all the technique uses different method to watermark and decode the data. Since these approaches follow reversible watermarking it is possible to recover the original data from them. But the fact is that none of these focus on textual database. It all focuses on numerical data and does not watermark textual fields. Here an efficient technique is proposed, by which the textual database can be watermarked and can be made secured against heavy attacks.



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PRIVACY PRESERVING THROUGH MEDIATOR IN DECENTRALIZED CIPHERTEXT POLICY ATTRIBUTE BASED ENCRYPTION

Varsha Thanaji Mulik¹, Shinu Acca Mani², Saritha K³, Suraj U Rasal⁴

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Abstract

In the previous cryptographic approach, network security is vigorously relied on user attribute based encryption, multiple authorities and cipher text policies to make it more sheltered to some extent. But to seal the lack of security level, cryptography shows keen to enhance the protective approach. Cipher text policy is one of the best cryptographic methods added to enhance the security level in recent networking trends. In this paper, both user attributes and data attributes are used as security credentials. File security is maintained by protecting data and its location. Multiple trusted authorities and Mediators are considered as validation users to make system more secure and reliable. Mediator concept is added to the proposed approach whose role is acting as a middleware between authorities and users for managing user rights. Data is stored in encrypted format and its regarding information can be accessed through the secrete key which is a combination of authority key and mediator key. Decryption speed is enhanced to balance the user waiting and response time. Since there is no storage of any user and data information in authority and mediator the entire data will be hidden. All these approaches enhance the encryption level to make system more secure and highly reliable.

Keywords: Mediator, Trusted Authority, Data Attributes, User Attributes.

I. INTRODUCTION

Networking is heavily based upon modern cryptographic technique which is a study of secret writing. Cryptography is an art which focuses on the methods of transforming original data into intelligible form and then transforming into original form.

Internet is also a source of data storage which shares the data only with the authenticated users. A user is said to be valid or authenticated user if and only if he have confirmed identity. Authentication can be also done by using certificates.

Traditional Asymmetric Cryptography is the previously existing public key encryption technique which uses certificate for identification purpose. Certificate is an electronic document which contains information about keys, user identity and digital signature. In this scheme, a certificate authority is used which provides an individual certificate for each user. Here a limitation occurs when number of users increase. As the number of users increases the number of certificates also increases. Due to which database used for certificate storage will get overloaded. As

an alternative to traditional public key encryption techniques, in 1984 Shamir introduced a new concept of Identity Based Encryption (IBE) to eliminate certificate storage. Shamir's approach used user's own identity such as an email-id or phone number as the public key instead of using the certificates. The IBE approach was first practically implemented in 2001. However, one to one communication is possible only by using IBE approach; it is not applicable for one to many communications. To resolve this problem, Fuzzy IBE [14] was introduced in the seminal work of Sahai and Waters. In fuzzy IBE we view identities as a set of descriptive attributes. It is a public - key encryption system that leads to an Attribute based encryption (ABE). In an ABE scheme a single central authority is responsible for maintaining the access control level. It becomes a challenge for a single authority when the numbers of user's are huge. In order to solve this problem a multiple authority ABE (MABE) scheme was designed by Sahai and Waters and later extended by Melissa Chase [8][7] in 2009. MABE services are mostly applicable on distributed system. So MABE makes the use of cryptographic technique which is called as Ciphertext Policy Based Encryption.

PRIVACY PRESERVING THROUGH MEDIATOR IN DECENTRALIZED CIPHERTEXT POLICY ATTRIBUTE BASED ENCRYPTION

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Abstract

In the previous cryptographic approach, network security is vigorously relied on user attribute based encryption, multiple authorities and cipher text policies to make it more sheltered to some extent. But to seal the lack of security level, cryptography shows keen to enhance the protective approach. Cipher text policy is one of the best cryptographic methods added to enhance the security level in recent networking trends. In this paper, both user attributes and data attributes are used as security credentials. File security is maintained by protecting data and its location. Multiple trusted authorities and Mediators are considered as validation users to make system more secure and reliable. Mediator concept is added to the proposed approach whose role is acting as a middleware between authorities and users for managing user rights. Data is stored in encrypted format and its regarding information can be accessed through the secret key which is a combination of authority key and mediator key. Decryption speed is enhanced to balance the user waiting and response time. Since there is no storage of any user and data information in authority and mediator the entire data will be hidden. All these approaches enhance the encryption level to make system more secure and highly reliable.

Keywords: Mediator, Trusted Authority, Data Attributes, User Attributes.

I. INTRODUCTION

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Internet is also a source of data storage which shares the data only with the authenticated users. A user is said to be valid or authenticated user if and only if he have confirmed identity. Authentication can be also done by using certificates.

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Latent Fingerprint Enhancement Using Sparse Representation

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ABSTRACT: Fingerprint recognition is the most widely used biometric to identify individuals. Latent fingerprint identification is of critical importance in criminal investigation. The system is focused on the dealing the issues of poor quality with unclear ridge structure and various overlapping patterns for the latent fingerprint images. Hence the methods are such as total variation (TV) model and multiscale patch-based sparse representation introduced to improve the reliable feature extraction and recognition as well as improve the image quality. It is also used to improve the sparse representation in image denoising. The specified image is decomposed into cartoon and texture component then apply the TV model on the cartoon component to remove the structured noise as well as multiscale patch-based sparse representation technique for the enhancement of the texture component. The Gabor dictionaries are constructed to capture the uniqueness of fingerprint ridge structure. Also multiscale patch-based sparse representation is iteratively applied to reconstruct high-quality fingerprint image. However this system is failed to achieve the global ridge structure for low quality latent fingerprints and hence reliability is reduced as well as system performance is degraded. To achieve the global ridge structure quality, an optimization algorithm named as firefly algorithm. Fingerprint image enhancement is an essential preprocessing step to extract qualitative minutiae from a fingerprint image. Image enhancement is mainly done by maximizing the information content of the enhanced image with intensity transformation function. The firefly algorithm is used to update the best features globally and global optimization is increased. This system is greatly reduced the noise rates in the specified latent fingerprint images and improves the global ridge structure significantly. From the experimental result, the conclusion decides that the global optimization provides higher performance rather than total variation (TV) model and multiscale patch-based sparse representation in terms of high image quality.

KEYWORDS: Latent fingerprint enhancement, sparse representation, multi-scale patch, Gabor dictionary.

1. INTRODUCTION

Fingerprint enhancement plays an important role in law enforcement agencies and forensic science for applications like criminal investigation, terrorist identification and crime scene investigation. There are three types of fingerprints: (a) Plain fingerprints which are acquired by pressing the finger on a flat surface, (b) Rolled fingerprints which contain almost all of the ridge details and are captured by rolling a finger from "nail to nail" either on a paper or the platen of a scanner and (c) Latent fingerprints as shown in Fig.1, which are simply lifted from surfaces of different object touched or handled by a criminal which is an extremely important source of evidence in crime scene investigation. Latent fingerprints captured from very small area depending on criminal situations. Due to the low image quality, automatic feature extraction is still undesirable for latent fingerprints and features (such as minutiae and singular points) need to be manually marked by latent examiners for identification [1], [5]. However, manual markup of minutiae features is not only time-consuming but also short of repeatability and compatibility. First, the minutiae features in the same fingerprint marked by different latent examiners or by the same examiner but at different times may not be same, which results in making different matching decisions on the same latent-exemplar pair. Second, in current practice, minutiae features in latent fingerprints are manually marked while the minutiae features in enrolled fingerprints are automatically extracted, which may cause a compatibility problem [3]. Thus, manually marking minutiae features is not the best



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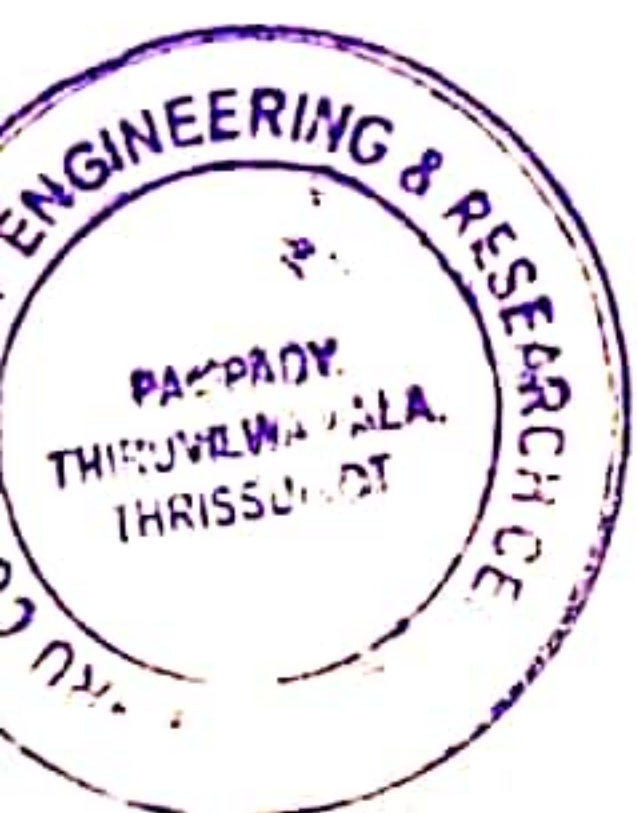
D. Divya

S. Subasree

N.K. Sakthivel

Abstract

The rapid evolution of mobile computing is driving a new alternative way in which infrastructure less Wireless Networks with self-configured mobile devices are called Mobile Ad hoc Networks (MANETs). Power Heterogeneity aware with load balanced congestion control is an important technical issue in MANET. Efficient Power Aware Routing (EPAR) selects path in which nodes have largest data packet transmission capacity with smallest residual battery power. Load balanced Congestion Control methodology is used to distribute the traffic load across the network for optimal resource utilization. The Load balanced Congestion Adaptive Routing (LBCAR) protocol maximizes the operational lifetime by using the congestion status of the nodes and link cost of the route in MANET. The proposed protocol Cluster based Adaptive Efficient Power Aware Routing (CAEPAR) consists of Cluster mechanism with energy efficient load balanced congestion control. The cluster-head selection in CAEPAR is based on the energy efficiency and congestion status of the nodes in the network. The performance of MANET using CAEPAR has been analyzed and compared with DSR, MTPR, EPAR, CRP and LBCAR. In dealing with congestion control and achieving good QoS constraints, CAEPAR is highly efficient and outperforms in terms of Residual Battery Power, Battery Power Consumption, Network Lifetime and Throughput.



A handwritten signature in green ink, appearing to be "Vd".

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A High Gain Soft Switched Interleaved Boost Converter with an Improved MPPT Control for PV Applications

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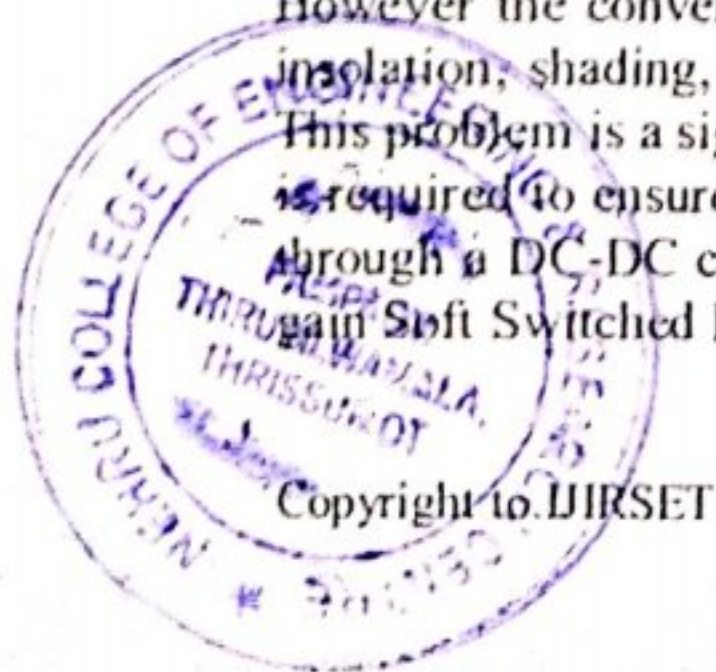
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ABSTRACT: PhotoVoltaic (PV) module is an important source of energy, it utilizes sunlight to generate electricity. PV system always has unique Maximum Power Point (MPP), depending on the environmental conditions this maximum power point keeps changing with the irradiance levels and ambient temperature. The output power produced from PV modules is directly proportional to the solar irradiation and inversely proportional to the ambient temperature. For better PV energy utilization it must be operated at equilibrium point, due to the low output voltage generated from PV module, DC-DC converters are required. In this system a high gain Soft-Switched Interleaved Boost (SSIB) DC-DC converter is used. The interleaved characteristic increases the flexibility and power rating of the converter. The high gain capability of the SSIB converter allows it to be connected directly to a Medium-Voltage (MV) DC bus. A Maximum Power Point Tracking (MPPT) technique is used for extracting the maximum power from the PV panel and transferring this power to the load. By the implementation of Model Predictive Control (MPC) technique for controlling the PV module can be used to modify the system in order to achieve more efficiency. This MPC based algorithm has the ability to track the maximum power under rapidly changing weather conditions and reaches to steady state at a very short time. Then the system attains a very high gain and it also enables reducing number of PV modules connected in series.

KEYWORDS: PhotoVoltaic (PV), SSIB converter, Interleaved technique, MPPT, MPC

I. INTRODUCTION

Global energy demand is growing continuously. In the past decades the capacity of PhotoVoltaic (PV) electricity generation system has been and is now gradually increasing. Moreover, many researchers and scientists state that photovoltaic system will play a key role in future energy needs. In order to meet the demand for energy in the near future itself we have to depend up on any other energy resources. To meet these requirements among the renewable energy sources solar energy is certainly favourable in terms of the environment. When compared with conventional energy sources such as coal, gasoline and oil etc. the solar energy is considered a satisfactory energy resource because it is very clean, inexhaustible, reliable, abundant and free of cost. A photovoltaic energy generation system would be one of the most beneficial alternative energy sources for the future. Interest in renewable energy sources continues to gain popularity with 60% annual growth in the installed capacity of PV systems from 2004 to 2009 and 80% in 2011[1]. However the conversion efficiency of the PV cell is less due to the rapidly changing atmospheric conditions such as insulation, shading, spectral characteristics of sunlight and dust which results in poor performance of the PV system. This problem is a significant obstacle against it's wide spread use. Therefore a Maximum Power Point Tracking (MPPT) is required to ensure the maximum available power from the solar panel. This generated power from PV panel is feed through a DC-DC converter. The converter boosts the output voltage which is tracked from the IV array. Here a high gain Soft Switched Interleaved Boost converter (SSIB) is used for this purpose. This interleaved technique gives out the



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LIGOs Detected Magnetic Field Waves; not Gravitational Waves

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Abstract: Two simultaneous observations for gravitational waves of two LIGOs in USA, which were observed on 14th September 2015, are attributed in this article to magnetic field waves; not to gravitational waves.

1: Introduction

A high level technical observatory to detect gravitational waves was first established by Weber in 1960s. His model contains a suspended heavy aluminum based metal bar, which is maintained at a very low temperature. If it receives a magnetic field wave, and if it agrees with its resonance, then by Meissner's effect, it may vibrate and the wave may be detected. Observe that Meissner's effect is applicable for aluminum based conductors, and hence Weber bars can be used to detect magnetic field waves. Two laser interferometer gravitational-wave observatories were established to detect gravitational waves from universe, at Hanford and at Livingston in USA with highest possible technologies. These two observatories observed signals on 14th September 2015, which were announced as signals due to gravitational waves received from giant celestial twin objects which have many light years distance from the earth. There are articles [4, 5, 7] which claim by using mathematical expressions that these LIGOs cannot detect gravitational waves. But, this present article accepts 2015 observations, and proposes logical reasons to believe that the signals were due to magnetic field waves received from those two giant objects. All reasons were stated in the articles [1, 2, 3, 6], indirectly. The present article states the reasons explicitly.

The article [1] observes the following. When a spherical body rotates itself about an axis, each electron in the body rotates about the axis of rotation in a circular path. The movement of all electrons in the body creates a magnetic field in the body. Permeability and susceptibility of the body and of the medium around the body are not

considered, and a formula is proposed in [6] to find approximate total magnetic field strengths at poles. A table is also provided in [6] to compare the magnetic field strengths of planets in our solar system. In the article [2], it is proposed that there is a wavelength, say k , in the spectrum of electromagnetic waves with the following characterization for waves having speed that is equal to the speed of light. The waves with wavelength less than k are free from magnetic field and the waves with wavelength greater than k are free from electric field. The former-type waves are called electric field waves and the latter-type waves are called magnetic field waves. One property of electric field waves mentioned in the article [3] is the following: The electric field waves repel electrons which are encountered by the waves.

2: Discussions and Results

Consider two self-rotating giant bodies, which have their own orbits or paths for motion. It was observed in the article [6] that the magnetic field of a rotating spherical body is directly proportional to the number of electrons per unit volume, directly proportional to the square of the diameter of the body (hence approximately proportional to the mass) and directly proportional to the angular velocity (or rotating speed). Let us assume that two giant bodies rotate with sufficient self-rotating speeds to produce huge amounts of magnetic fields. When the bodies are sufficiently close to each other, the magnetic fields are disturbed, by means of attraction or by means of repulsion. The disturbed intersecting magnetic fields create a force, which may affect the positions (including orbits) or the speeds of the bodies. This force may exist for a while until the distance between these bodies increase, when the bodies proceed along their orbits or paths. Since the bodies have heavy masses and high speeds, these forces cannot do changes in the positions and the speeds of bodies, for a while. So, the force created by the disturbed intersecting magnetic fields should



Simplified Interpretation for Einstein's Energy Mass Relation

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Abstract: A simplified interpretation for equivalence of energy and mass which appear in the energy – mass relation of Einstein is presented without using Lorentz transformation and Maxwell equations. A shortest derivation of this relation is presented by using the definition of energy in terms of force and work, by assuming that no particle reaches a velocity that is greater than the velocity of light, and by using the interpretation.

Keywords: Energy; Mass; Velocity of Light.

Section 1: Introduction

This short note avoids Lorentz transformation and Maxwell equations. This note does not consider the derivations of Einstein [2] and interpretation of others to explain his energy – mass relation. This note is based on the assumption that velocity of a moving particle or propagating energy cannot exceed the velocity of light in vacuum. This is the fundamental assumption in the special theory of relativity. This note assumes Newton's second law of motion in the following form: Force is equal to the rate of change of linear momentum with respect to time. This note assumes the definition of energy in terms of work and force, and the classical derivation of the kinetic energy of a particle moving in a straight line with a uniform velocity.

Section 2: Interpretation

A part of the mass of a fire-wood is converted into energy, when it is burnt. Although it is not verified, let us assume with an imagination that the sunlight energy is converted indirectly as a part of the mass of a living tree (There is an article [3] which provides an experimental evidence for energy to matter conversion). Thus, there are chances to convert a mass into energy, and energy into mass. It should be understood that there is a conservation of "energy + mass" in a "closed"

system. So, any example may be considered to derive the energy – mass relation within an "energy + mass" system. Let us consider a classical example. Consider a radioactive material which is permitted to decay and to convert mass into energy through radiation. Let us assume with an imagination that all particles are radiated, and the mass becomes nothing at some stage. Let us again assume with an imagination that each elementary mass dm of the given mass is permitted to move at the maximum possible velocity, the velocity of light in vacuum. Total emitted energy is the energy in the energy-mass formula of Einstein. This interpretation is experimentally supported in the article [4]. With these formal assumptions, let us proceed towards an elementary derivation, which is also a shortest one.

Section 3: A Derivation

Let

M = initial mass of an object at time zero,

m = mass of the object at a general time,

v = velocity of the object at a general time,

F = force applied on the object,

x = distance travelled by the object at a general time,

t = a general time,

c = velocity of light in vacuum (a constant), and

E = total energy that is to be derived from M .

Observe from the Newton's second law that

$$F = \frac{d(mv)}{dt} = m \frac{dv}{dt} + \frac{dm}{dt} v.$$



A High Efficiency Step-Up DC-DC Converter Combining KY and Multilevel Modular Converter with Low Switching Voltage and Current Stress

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Abstract: A novel step up converter is presented, which combines the KY converter and the Multilevel Modular Converter (MMC). The proposed system combines KY and MMC. MMC is integrated to reduce the voltage and current stresses of switching device, improve efficiency, and fault-tolerant capability. The KY converter contains SR boost converter and coupled inductor with the turn's ratio it is used to improve the voltage gain. Therefore, the voltage gain is higher in the converter output, and can be determined by adjusting both the duty cycle and the turn's ratio. The proposed step-up converter has no floating output current, and reducing the output voltage ripple. By combining achieves the features of KY and MMC.

1. Introduction

Now a days the demand of green power is increased gradually. Solar, wind, fuel, geothermal, biomass are some sources of green power. Lot of applications, converters have much importance, such as boosting the small output voltage to high voltage. The voltage gains of buck-boost converter and traditional boost converter are not high for the loads need. Till now, a lot of voltage-boosting techniques presented, such as inductors and charge pump, coupled inductors, here the output voltage become floating, this will result to increase the complexity of the application, and also these converters are made up of so many components therefore the converters relatively complicated. In many situations the output current are non-pulsating, the voltage gain is inadequate. In HVDC use of DC/DC power converters increase output voltage to the high voltage (HV) level, and it results to efficient transmission for long distances. HVDC results to reduce the power losses, cabling cost, step up grid bulky transformer etc. A new Voltage boosting converter is described here, and combines KY converter with Multilevel Modular Converter. Here KY converter having one SR buck-boost converter connection, and also one coupled inductor having turn's ratio. It is used to increase the voltage gain. The MMC containing SC or CC. SC or CC based

DC-DC converters are used in high power applications and they are having advantages like high power density, high efficiency and control simplicity. For offshore system the exponential voltage gain was implemented using SC DC-DC with the help of Marx concept. Combination of top and bottom cells provide high degree of modularity in each cells. The main important thing of modularity method is, when a single module fails, the converter can function at a reduced power level. It is also practicable to localize any fault in the system, hence system reliability can improve. It's having less maintenance, since it takes small interval of time to clear the fault. In modular structure the usage of cheaper components which is having low voltage / current stress in a system helps to distribute the power handling in multiple modules. MMC is integrated to reduce the voltage and current stresses of switching device, improve efficiency, and fault-tolerant capability.

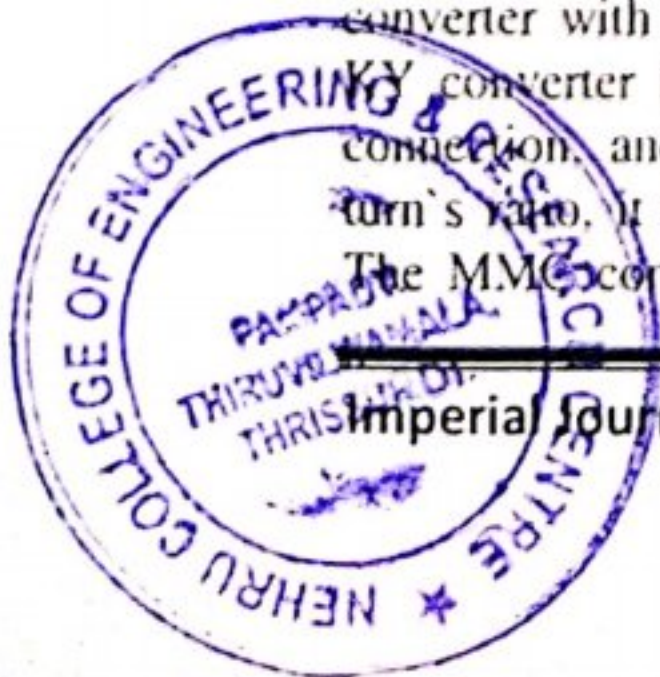
2. SYSTEM CONFIGURATIONS

There are two system to be explain, they are,

- 1 KY converter
- 2 Multilevel Modular Converter
- 3 Combination of KY converter and MMC

2.1 KY converter

The KY converter is shown in Fig 1, which consists of MOSFETs switches namely S_1 and S_2 . For voltage gain enhancement there uses a coupled inductor with turns ratio, its primary is known as N_p and the secondary is N_s . C_1 is known as energy transferring capacitor, C_2 is charge pump capacitor. A diode D_1 is used, the output side containing Output capacitor C_o , resistor R_o . The input voltage is V_i , output voltage is V_o .



A Design for Charging Section of Electrostatic Precipitators by Applying a Law for Electric Field Waves

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Abstract: A law for electric field waves is proposed, and justifications for this law are given in terms of known examples. This law is applied to design a charging section of electrostatic precipitators.

Key words: Electrostatic precipitators; Vacuum diode; Seebeck effect.

Introduction

Scientists derived fundamental laws of nature from observations. These laws were guessed and they were verified directly or indirectly through observations. Some laws can be established through some other verifiable laws. The present article presents a simplified law for electric field waves by observing a property of these waves. It was observed in the article [4] that electromagnetic waves are either electric field waves or exclusively magnetic field waves. Light waves are identified as electric field waves. Thus a law is proposed in the present article for light waves. Heat energy produces light waves. So, a modified version of this law for heat energy is also stated. An electromagnetic wave is an electric field wave, if it is created by an electric field and if it creates an electric field. An electromagnetic wave is a magnetic field wave, if it is created from a magnetic field and if it creates a magnetic field. More details may be found in the article [4], in which it was observed that light waves are the electric field waves. According to the articles [2, 8], self-rotating planets or stars have magnetic field. Two nearby rotating planets or rotating stars may produce magnetic field waves. The magnetic field of a rotating planet or a rotating star may deflect magnetic field waves. Thus, there may be an effect of a magnetic field over a magnetic field wave. The effect of an electric field wave over a electron of a molecule is proposed in the next section as a law. Some justifications for this law are presented in the present article. One

justification is used to design a charging section for electrostatic precipitators.

The laws proposed

First law: If an electric field wave (or a light wave) strikes a free electron of a molecule of a material, it tries to repel the electron in the direction of the wave.

Second law: If heat energy is applied to a material, the free electrons of the molecules of a material which receive the energy are repelled.

It is expected that an electric field wave may affect the electrostatic field of an electron, and so the first law is proposed. Since heat energy is associated with light waves, the second law for heat is proposed. This second law will also be justified through known examples.

Justifications

A classical solar cell consists of two semiconductors; one is n-type and another one is p-type. When light rays fall on the n-type semiconductor, by the first law, these rays push free electrons of molecules of the n-type semiconductor towards the adjacent p-type semiconductor. The p-type semiconductor receives these free electrons and there is a potential difference between outer surfaces of the different types of semiconductors. It seems that p-type semiconductors are acceptors of free electrons through "holes" and n-type semiconductors are donors of free electrons of molecules. One may search for donors and acceptors from materials used as anodes and cathodes of electrochemical cells, and from materials used for thermocouples. The second law can be applied to explain current production in case of a thermocouple, in which again there are two conductors; one is an acceptor of free electrons and another one is a donor of free electrons of



An Optimal PV Powered 9-Level H-Bridge Inverter fed Induction Motor Drive

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ABSTRACT: In this paper a single phase 9 level inverter Photovoltaic (PV) fed Induction motor drive is presented. The proposed system uses only 7 switches for producing 9 level output which is fed from a PV source. Fundamental Switching scheme and Selective Harmonics Elimination were implemented to reduce the Total Harmonics Distortion (THD) value. The lower order harmonics is eliminated by Selective Harmonics Elimination Stepped Waveform (SHESW) method. Maximum Power Point Tracking (MPPT) algorithm allows optimal utilisation of solar energy. The control circuit necessary for multilevel inverter operation is implemented using a Microcontroller, reducing overall system cost and complexity. To assess the proposed inverter, it is compared with the conventional single-phase five-level cascaded PWM inverter. Finally the simulation results are discussed and analysed in order to verify the effectiveness of the proposed design.

KEYWORDS: Photovoltaic, Total Harmonic Distortion, Selective Harmonic Elimination, Maximum Power point Tracking, Induction Motor.

I. INTRODUCTION

Today, most of the research is focused on the effective utilization of non-conventional energy sources. Of all the existing non-conventional sources of energy, Solar Photo Voltaic technology [1][4][5] is easily utilizable and popularly used which absorbs the everlasting solar energy at free of cost and it is eco-friendly without generating any kind of pollution into the atmosphere and offers low noise, when compared with other conventional energy sources. The generated DC power from PV array is conditioned or transformed to required form using Power Conditioning Unit (PCU). The PCU can be any inverter or converter circuit depending on application of PV system. Single phase induction motors are widely used in industrial applications, especially in fractional horse-power field due to its easy construction, high robustness, and good efficiency. They are extensively used for electric drive for low power constant speed apparatus such as machine tools, domestic apparatus and agricultural machinery in circumstances where a three-phase supply is not readily available. Based on number of levels at the output inverters can be broadly classified into two types: 2-level inverter and Multi-Level Inverter (MLI) [6]. Multilevel inverters have nearly sinusoidal output-voltage waveforms, output current with better harmonic profile, less stressing of electronic components due to reduced voltages, switching losses that are lower than those of conventional two-level inverters, a smaller filter size, and lower EMI, all of which make them cheaper, lighter, and more condensed [2][3]. High magnitude and quality output voltage can be obtained in MLI using more number of low value independent DC sources with reduced value of dv/dt stress on the switches. Cascaded H-bridge [20]-[26] inverter topology is used, it does not require additional clamping diodes, eliminates neutral point fluctuations problem when compared with conventional Neutral Point Clamped MLI. It eliminates the requirement of large value capacitors when compared with Flying Capacitor [13]-[19] or NPC. It not only achieves high power ratings, but also enables the use of small renewable energy sources with low output voltage [7]. Block diagram is shown in fig. 1



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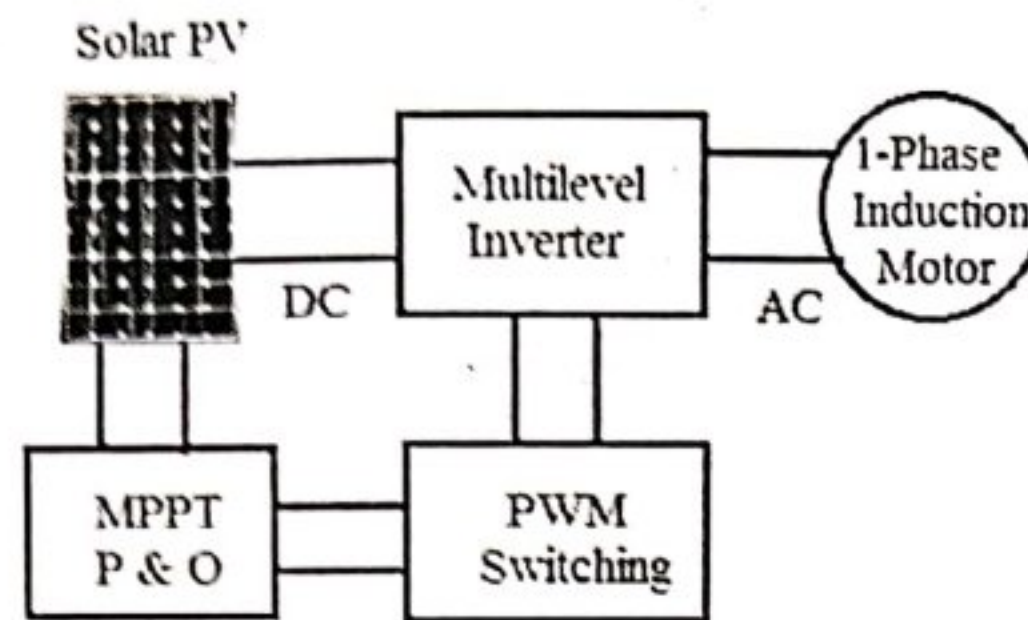


Fig.1 PV Powered MLI fed IM

A single-stage PV fed induction motor for irrigation purpose is planned to implement. PWM inverters [10-11] have been extending their range of use in industry because they provide reduced energy consumption, better system efficiency, improved quality of product, good maintenance. Speed control with MPPT technique, meets the basic requirements of simplicity and cost effectiveness for controlling Induction motor [12]. In this paper, section II describes the operation and modelling of the proposed system. Section III gives the simulation results and analysis for the proposed system. The last section discusses the conclusions.

II. RELATED WORK

1. Using Multi level inverter will increase the magnitude of voltage, switching stress is reduced and overall harmonic profile is improved.
2. High magnitude and quality output is obtained by more number of low value independent DC source.
3. Increase the number of output voltage level will decrease the THD rate of the system.
4. Cascaded Multilevel inverter is preferred over other topologies because it does not require additional clamping diodes, large value of capacitors.
5. MPPT algorithm will to provide constant supply to inverter.
6. Decrease in number of active switches will reduce the THD rate.
7. More levels of output voltage will help to allow wide range of induction motor speed control.

III. OPERATION OF PROPOSED SYSTEM

A single-phase simplified multilevel inverter has the following advantages over other existing multilevel inverter topologies. 1) It consists of single-phase conventional H-bridge inverter, bidirectional auxiliary switches and a capacitor voltage divider formed by capacitors. 2) Improved output waveforms. 3) Smaller filter size. 4) Lower electromagnetic interference (EMI) and total harmonic distortion (THD). 5) Reduced number of switches employed. 6) Less complexity of the circuit as the levels increase. 7) Attains minimum 40% drop in the number of main power switches required. Moreover, since the capacitors are connected in parallel with the main dc power supply, no significant capacitor voltage swing is produced during normal operation, avoiding a problem that can limit operating range in some other multilevel configurations. The given system consist of a 9 level inverter integrated with PV source and single phase induction motor as shown in fig 2. The generated PV power is conditioned by the 9-level inverter so that it can be utilized by motor effectively. Cascaded H-bridge inverter topology and MPPT algorithm will take care of effective utilization of PV panel. The main objective is to improve the output voltage quality with less number of switches there by wide range of speed control is achieved. The developed model consists of a solar PV array, 9-level Cascaded H-bridge inverter and Induction motor.




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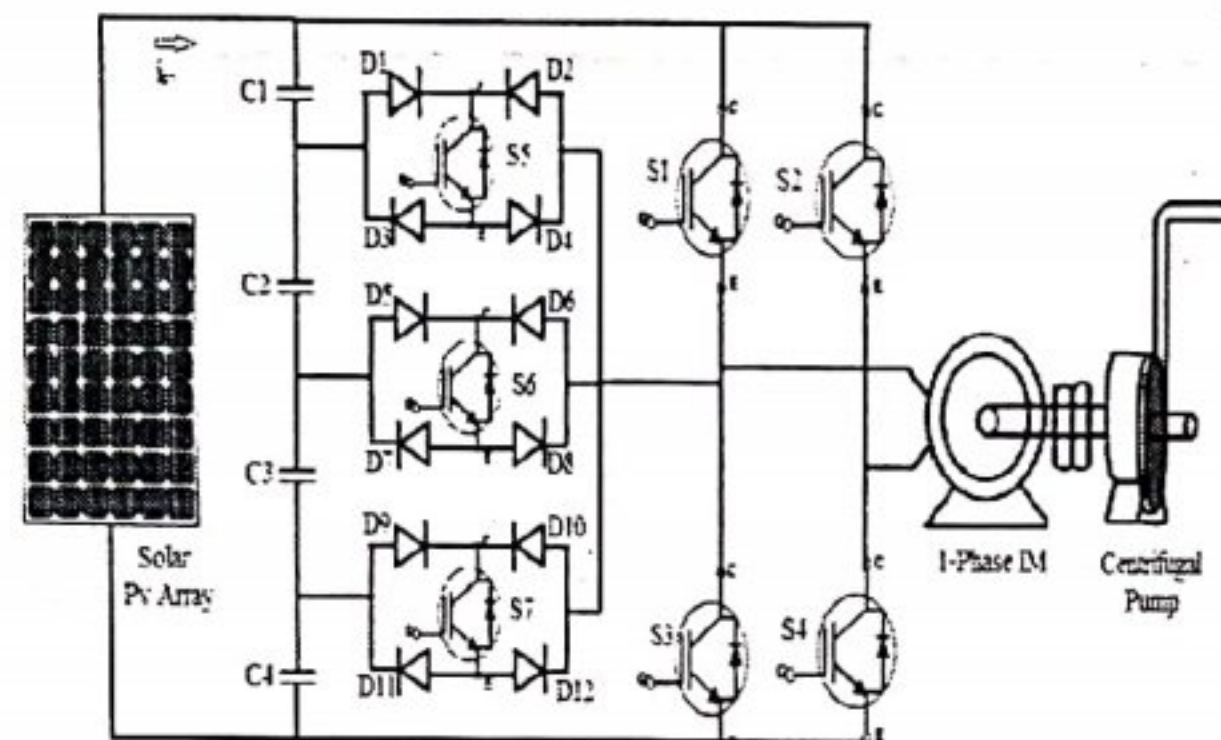


Fig.2 PV fed 9-level H-bridge Inverter fed Induction Motor

A. PV Array Model

The solar Photovoltaic (PV) system converts the solar energy into electrical energy. The basic element/device in a solar array is the solar cell, which is basically a p-n junction semiconductor device. Photovoltaic arrays present a nonlinear I-V characteristic with several parameters that need to be adjusted from experimental data of practical devices. The mathematical model of the photovoltaic array may be useful in the study of the dynamic analysis of converters, in the study of maximum power point tracking (MPPT) algorithms and mainly to simulate the photovoltaic system and its components using circuit simulators.

B. 9-level H-bridge Inverter

The simplified nine-level inverter was developed from the five-level inverter in [24] [28]. It contains a single-phase traditional H-bridge inverter, three auxiliary switches S5, S6, S7 and a capacitor voltage divider formed by four capacitors C1, C2, C3, and C4, as illustrated in Fig 4.

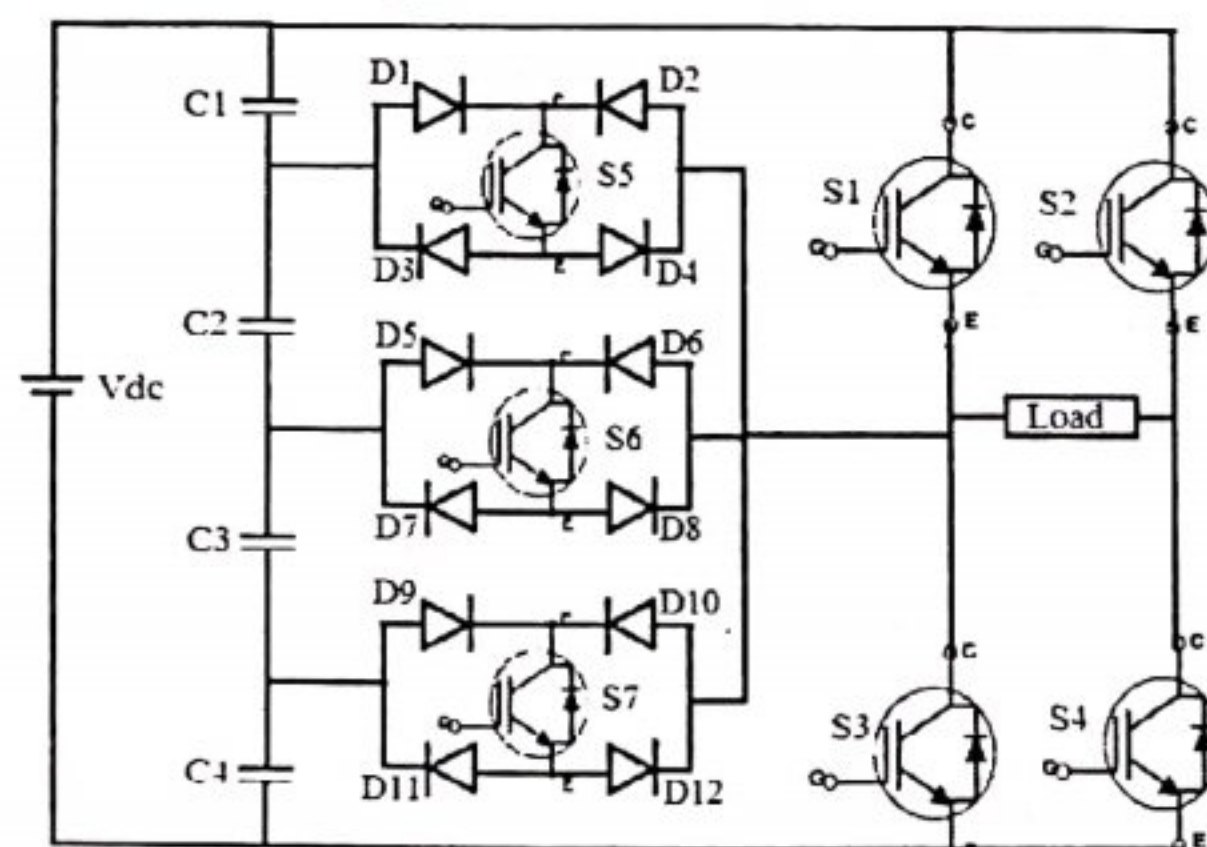


Fig. 4 Nine level H-bridge Inverter Topology

The auxiliary switches, formed by the controlled switch S5, S6 and S7 and with twelve diodes, D1 to D12. The single phase simplified nine-level inverter power circuit with auxiliary switches is shown in figure 4. Proper switching of inverter can produce nine output voltage levels V_{dc} , $3V_{dc}/4$, $2V_{dc}/4$, $V_{dc}/4$, 0 , $-V_{dc}/4$, $-2V_{dc}/4$, $-3V_{dc}/4$, $-V_{dc}$ from the dc supply voltage V_{dc} .



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1. Mode I Operation

The switch S1 is ON, connecting the load positive terminal to V_{dc} , and S4 is ON, connecting the load negative terminal to ground. Remaining switches S2, S3, S5, S6 and S7 are OFF; the voltage across the load terminals is V_{dc} .

2. Mode II Operation

The bidirectional switch SS is ON, connecting the load positive terminal, and S4 is ON, connecting the load negative terminal to ground. Remaining switches S1, S2, S3, S6 and S7 are OFF; the voltage across the load terminals ab is $3V_{dc}/4$.

3. Mode III Operation

The bidirectional switch S6 is ON, connecting the load positive terminal, and S4 is ON, connecting the load negative terminal to ground. Remaining switches S1, S2, S3, SS and S7 are OFF; the voltage across the load terminals ab is $2V_{dc}/4$.

4. Mode IV Operation

The bidirectional switch S7 is ON, connecting the load positive terminal, and S4 is ON, connecting the load negative terminal to ground. Remaining switches S1, S2, S3, SS and S6 are OFF; the voltage across the load terminals ab is $V_{dc}/4$.

TABLE I
SWITCHING COMBINATION OF NINE LEVEL INVERTER

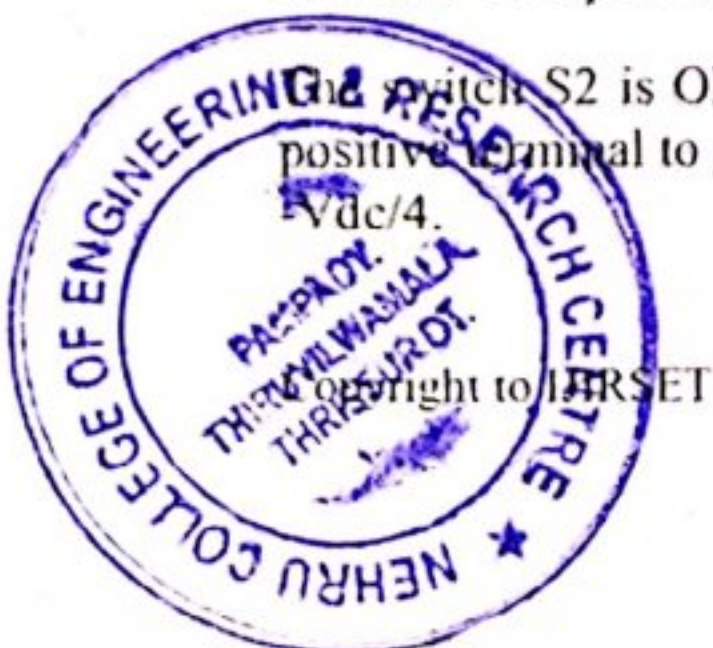
V_o	S1	S2	S3	S4	S5	S6	S7
V_{dc}	On	Off	Off	On	Off	Off	Off
$3V_{dc}/4$	Off	Off	Off	On	On	Off	Off
$2V_{dc}/4$	Off	Off	Off	On	Off	On	Off
$V_{dc}/4$	Off	Off	Off	On	Off	Off	On
0	On	On	Off	Off	Off	Off	Off
0*	Off	Off	On	On	Off	Off	Off
$-V_{dc}/4$	Off	On	Off	Off	On	Off	Off
$-2V_{dc}/4$	Off	On	Off	Off	Off	On	Off
$-3V_{dc}/4$	Off	On	Off	Off	Off	Off	On
$-V_{dc}$	Off	On	On	Off	Off	Off	Off

5. Mode V Operation

This mode of operation has two possible switching combinations. Either switches S3 and S4 are ON, remaining switches S1, S2, S5, S6 and S7 are OFF or S1, and S2 are ON, remaining switches S3, S4, SS, S6 and S7 are OFF. In both switching combinations load terminals are short circuited, hence the voltage across the load terminals is zero.

6. Mode VI Operation

The switch S2 is ON, connecting the load negative terminal, and bidirectional switch SS is ON, connecting the load positive terminal to ground. Remaining switches S1, S3, S4, S6 and S7 are OFF; the voltage across the load terminals is $V_{dc}/4$.



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7. Mode VII Operation

The switch S2 is ON, connecting the load negative terminal, and bidirectional switch S6 is ON, connecting the load positive terminal to ground. Remaining switches S1, S3, S4, S5 and S7 are OFF; the voltage across the load terminals is $-2V_{dc}/4$

8. Mode VIII Operation

The switch S2 is ON, connecting the load negative terminal, and bidirectional switch S7 is ON, connecting the load positive terminal to ground. Remaining switches S1, S3, S4, S5 and S6 are OFF; the voltage across the load terminals is $-3V_{dc}/4$.

9. Mode IX Operation

The switch S2 is ON, connecting the load negative terminal to V_{dc} , and S3 is ON, connecting the load positive terminal to ground. Remaining switches S1, S4, S5, S6 and S7 are OFF; the voltage across the load terminals is $-V_{dc}$.

IV. SIMULATION RESULTS

The simulation model was designed using MATLAB/Simulink Software. The gating signals for the inverter are generated by using multicarrier pulse width modulation technique. The circuit was simulated with induction motor load. The Simulation diagram is shown in fig 5

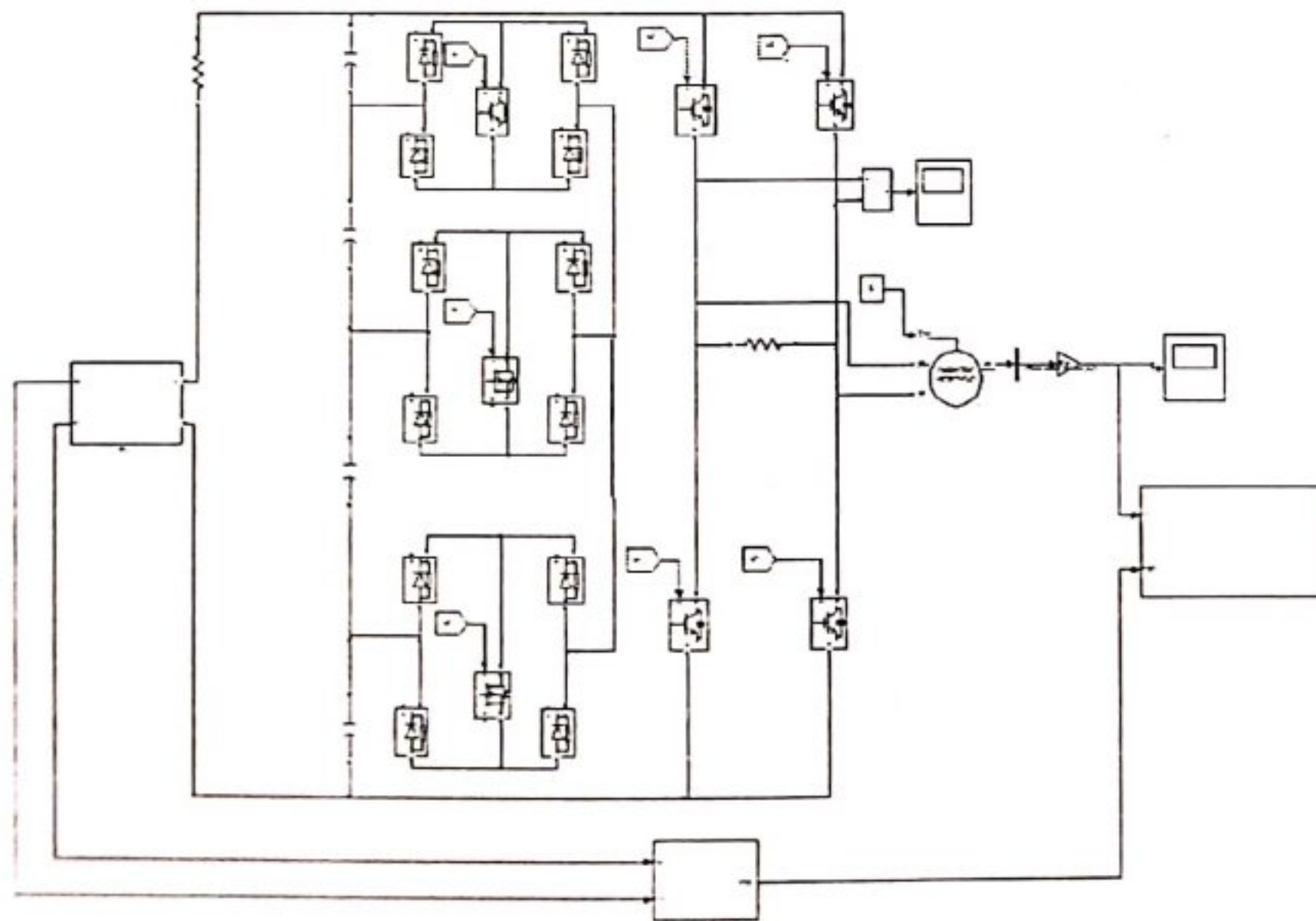
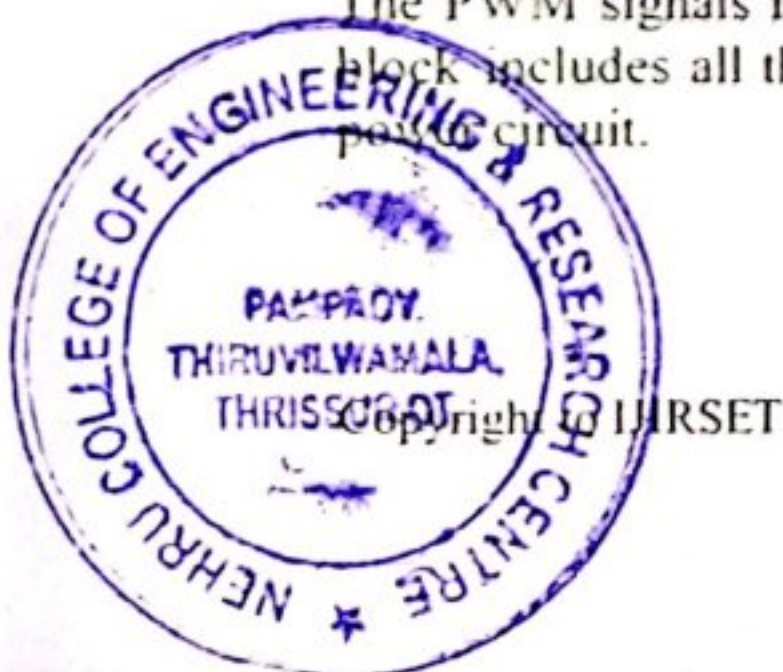


Fig.5 Circuit for Nine level Cascaded Multilevel Inverter

The PWM signals for each of the switching devices in the power circuit come from the PWM generator block. This block includes all the PWM signals required for switches are multiplexed on a single bus to the nine -level inverter power circuit.



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Nine-Level Output Voltage



Fig. 6 Output Waveform of simplified Nine Level Inverter

Figure 6 shows the simulated nine-level output voltage waveform of the circuit.

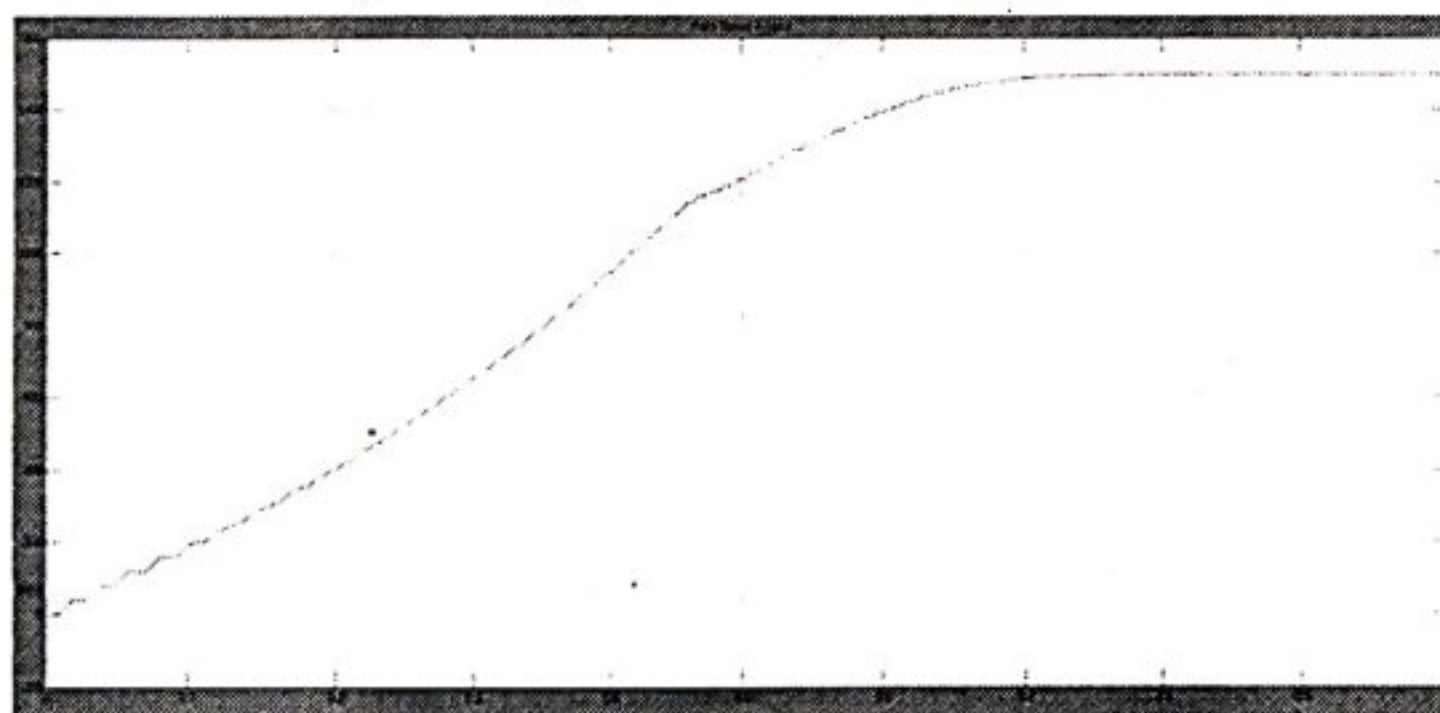


Fig. 7 Simulation Output of Induction Motor

Figure 7 shows the simulated waveforms for a single phase nine level inverter fed capacitor start-run IM parameters. The simulation results shows nine-level output voltage and rotor speed. The speed of the single-phase IM increases linearly and at steady state it reaches the rated speed of 1500 rpm.

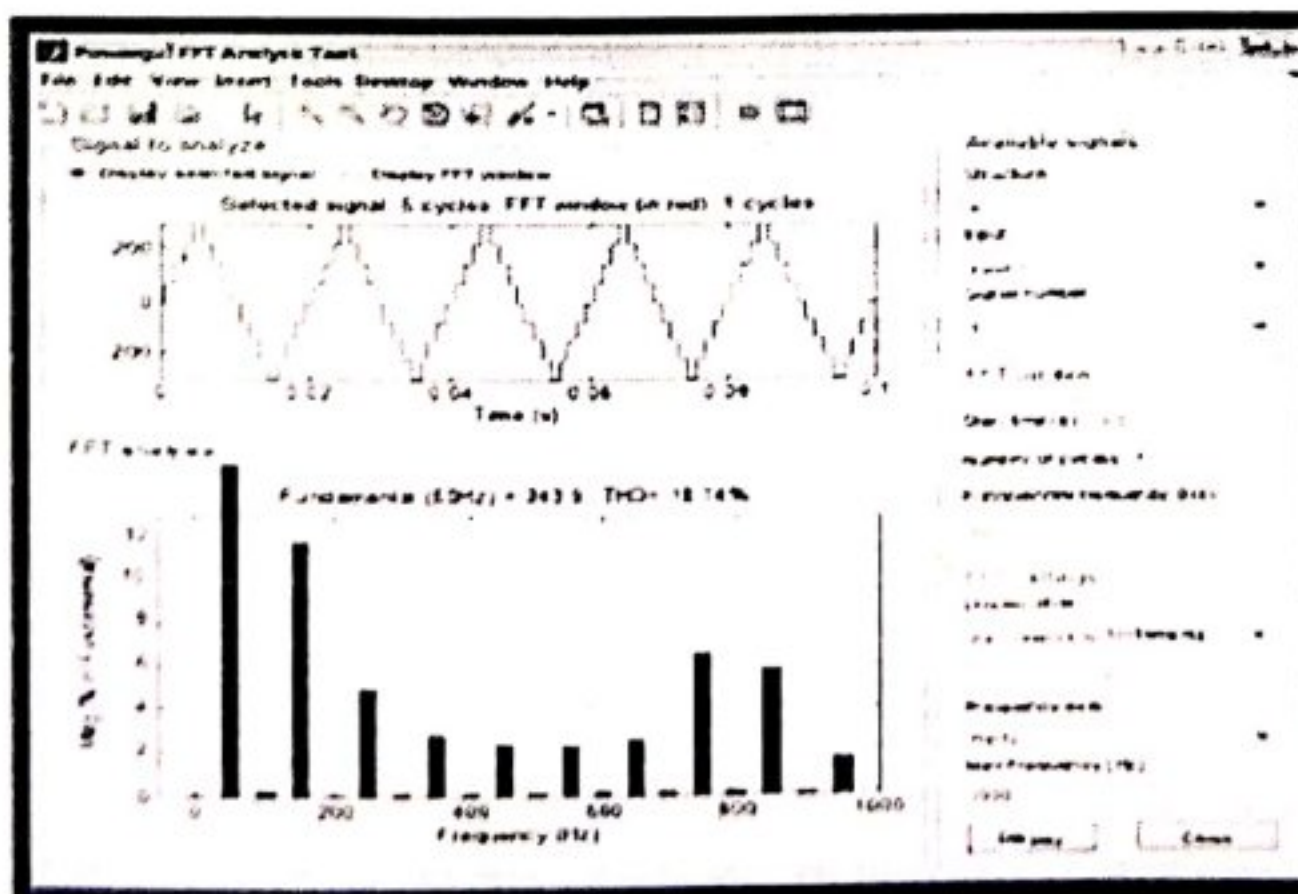


Fig. 8 THD of Nine Level Inverter

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The Total Harmonic Distortion (THD) of the nine level inverter is observed that 18.14% and fundamental voltage is 243.9V (50Hz) that has been illustrated in figure 8.

CONCLUSION

Multilevel inverters have become an effective and practical solution for increasing power and reducing harmonics of ac waveforms. This project deals with the design and implementation of single-phase nine-level Cascaded H-bridge multilevel inverter for induction motor load with multicarrier phase-shifted PWM modulation method. An optimal and efficient PV powered H-bridge inverter fed induction motor is presented. A simple MPPT algorithm and control strategy has been used, which makes the system to operate at higher efficiencies. The fundamental switching scheme is achieved using the microprocessor. By using the Selective harmonics elimination method the firing angles are calculated and fed to the inverter. The simulation results shows that the developed nine-level Cascaded H-bridge Multilevel inverter has many merits such as reduce number of switches, lower EMI, less harmonic distortion and the THD obtained is 18.14%. The study of this topology can also be extended to three phase induction motor and also to reduce the number of switches. By using the proposed topology wide range of speed control can be achieved.

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Global Magnetic Field Strengths of Planets From A Formula

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ABSTRACT

This article provides a derivation to evaluate proportionate values of magnetic field strengths of planets, assuming that planets are perfect in some aspects. The corresponding proportionate values are found for planets of our solar system.

Keywords: Magnetic Field of Planets.

I. INTRODUCTION

This is a continuation of the article [1] of the authors. It was observed in the article [1] that movements of materials lead to movements of electrons of the materials. So, rotations of planets lead to global magnetic fields of plants and internal movements of materials of planets lead to local magnetic fields of planets. It is assumed for derivation of a formula that planets have perfect spherical shape and they have uniform "electron velocity". In this article, "electron density" will mean the number of electrons in a unit volume.

II. METHODS AND MATERIAL

Derivation for the formula

Consider a rotating planet with radius R and with uniform electron density ρ . Let T be the fixed time required for one complete rotation about its axis of rotation. Suppose the axis of rotation lies in the z -axis and the equator-circle lies on xy -plane with centre at origin of the xyz -Cartesian coordinate space. Consider a circle C on the upper semi sphere which also lies on a plane that is perpendicular to the axis of rotation. Suppose the line joining any point on C with the origin makes an angle Θ with the xy -plane. Then

the radius of the circle C is $R \cos \Theta$. So, the magnetic field strength produced by the particles on the rotating disc containing C is directly proportional to

$$\int_{s=0}^{R \cos \Theta} \rho \left(\frac{s}{T} \right) ds,$$

when $2\pi/T$ is the angular velocity of any particle on the disc containing C . So, the magnetic field strength produced by the particles of the rotating planet is directly proportional to

$$\int_{\theta=-\pi/2}^{+\pi/2} \left(\int_{s=0}^{R \cos \theta} \rho \left(\frac{s}{T} \right) ds \right) d\theta = \rho(R^2/2T) \left(\int_{\theta=-\pi/2}^{+\pi/2} \cos \Theta \cdot \cos \Theta d\Theta \right).$$

This is directly proportional to $\rho(D^2/T)$, where D is the diameter of the planet. Thus the magnetic field strength of the rotating planet is $k\rho(D^2/T)$, where k is a constant which is universal for all planets, and which depends on the units for length, time, and energy for electrons.

III. RESULTS AND DISCUSSION

The two columns of the table presented here for diameter and rotating period are available in the website : nssdc.gsfc.nasa.gov/planetary/factsheet/index.html. See [2] for additional information.




Rotating Bodies Do Have Magnetic Field

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ABSTRACT

The existence of magnetic field of earth is justified in this short research note through the classical right hand palm rule for current and magnetic field.

Keywords : Earth Magnetic Field, Right Hand Palm Rule, 2010 AMS Subject Classification: 86A04

I. INTRODUCTION

The existence of magnetic field of earth is always associated with the existence of magnetic materials and hot matters in core part of earth, when hypotheses are proposed for this existence of magnetic field (see, for example [1,2]). A new hypothesis based on "electron density" (which may be defined as the number of electrons per unit volume or defined as the mass of electrons per unit volume) is proposed in this short research note.

II. METHODS AND MATERIAL

Right Hand Palm Rule

When a direct current from a battery is passed through a conducting wire, a magnetic field is produced around the wire. The followings are assumed in existence of this magnetic field: (a) Electrons are moving along the wire, and moving electric field of charges of electrons create magnetic field; (b) It is being unknown about movements of protons and neutrons; and (c) Charges in protons do not affect the magnetic field created by charges in electrons. Let us recall the classical right hand palm rule. Consider a coil connected to a battery that gives a direct current. If the coil is held in the right hand so that the fingers point in the direction of the current in the windings, then the extended thumb points in the direction of the magnetic field. This rule is applicable even for a single current loop carrying

current. That is, this rule is applicable for a single circular loop in which electrons move in a particular direction. However, the direction of the current is opposite to the direction of electron movements. In addition to this convention, it should be noted for discussions in the next section that the north magnetic pole of the earth is near to the south geological pole.

III. RESULTS AND DISCUSSION

Existence of Earth Magnetic Field

Consider any imaginary circle on the earth (or, inside the earth), such that its centre lies in the axis of rotation and the circle lies on a plane that is perpendicular to the axis of rotation. The materials of this circle rotates about its axis of rotation. So, the electrons of the materials of this circle move along the circular path in the rotating direction of the earth. Let us apply the final version of the above mentioned right hand palm rule to each such circle, for circular movements of electrons, by considering each circle as a single circular loop. Then, one can understand the existence of present magnetic field of earth, along with the direction of this magnetic field.

The existing direction of the magnetic field of the earth can be reversed, only if the direction of rotation of the earth can be reversed. The different electron density at different places and interior liquid flow of hot materials should affect symmetry in the magnetic field of earth. The magnetic materials in the earth may be a reason for



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Speed Control of a Dual Input Converter fed DC Motor with High Voltage Gain and Internal Battery Charging for Hybrid Electric Vehicles

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ABSTRACT: Renewable energy resources like solar, wind etc are widely used due to its advantages of non pollution and omnipresent. Thus it has become an alternative source to fossil energy which is now used in the Hybrid electric vehicle technology to reduce the pollution due to hydrocarbon emission. Since the solar energy is unstable and discontinuous in nature a multi input converter circuit is used to integrate the energy sources like battery etc. A dual input converter with solar power as primary source and battery as an auxiliary source is proposed here. The high voltage gain and the internal battery charging is attained by using the coupled inductors. According to measure of solar irradiation there are three states of operations. the standalone power supply state (when solar power is enough to drive motor) , the charge state (when solar power is more than enough to drive motor) and the unify power supply state (when the solar power is not sufficient to drive the motor).The speed of the motor is controlled by using the fuzzy logic controller to run the motor at a 1500 rpm. The hardware prototype is implemented to check its feasibility.

KEYWORDS: Dual input converter. Hybrid Electric Vehicles. Fuzzy Logic Controller. Renewable resources

I. INTRODUCTION

One of the most critical issues for the environment today is pollution generated by hydrocarbon combustion which is one of the main sources of power for transportation. Hybrid Electric Vehicles (HEV's) and Electric Vehicles (EV) are an alternative to conventional fuel powered cars and are efficient, more reliable, significantly less complex, cost effective, and environment friendly. However, HEV's have some disadvantages which are the primary obstacle to their widespread distribution. One of the major issues is that the battery should be charged overnight from the electric power grid where energy can be generated from renewable sources. Another major disadvantage of HEV's is short driving range with electric motors due to low efficient electric power supply system. Power electronic converters and new semiconductor devices are key components to meet the targets of extended mileage range and reduced pollution.

The growing concern about the protection of natural environment, global warming and depletion of non renewable energy resources has paved the way for the use of renewable energy resources. Solar energy is the most prominent renewable resource which is present abundantly in the nature. The Maximum Power Point Tracking (MPPT) is a technique used with solar systems to maximize power output. The purpose of MPPT system is to sample the output of the PV cells and apply the proper resistance to obtain maximum power for any given environmental conditions. Single input boost converters will be giving a voltage gain of 2 to 3 which is not sufficient for HEV's application. Different energy sources such as solar-PV, wind, fuel cell, battery, ultra capacitor etc., are highly utilized as a primary energy sources in the modern HEV's to improve the performance and efficiency. The conventional approach of connecting multiple energy sources is placing them either in series or parallel with each other. Sources that are placed





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A Novel Multilevel Inverter Employing Additive and Subtractive Topology

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Production of Biodiesel from Chicken Fat, Pork Fat and Combination of the above Two Feed Stocks

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ABSTRACT

In this study the high viscosity liquid fuel approximately 20 times that of diesel, produced from chicken fat, pork fat and combination of the above two feedstocks are used for the production of biodiesel in a two-step trans-esterification process. The first step called pre- esterification process was done by using 6% by weight of hydrochloric acid and methanol to oil molar ratio as 6:1 at 60°C reaction temperature and 120 minutes of reaction time to reduce the FFA level less than 1%. The second step called tras-esterification reaction is carried out using 6:1 methanol to oil ratio along with potassium hydroxide (KOH) by 1% of the oil weight as alkaline catalystat 60°C reaction temperature and 120 minutes reaction time to produce the bio-diesel. The lower viscous biodiesel produced through trans-esterification process is then blended with pure diesel in three different ratios by volume to know its suitability for the commercial engine. . The study also includes measurement of both physical and chemical properties on the produced biodiesel, blended bio-diesel and the conventional diesel. The main objective of this paper is to recommend the best fuel among the produced bio-diesel as an alternative to the conventional diesel.

Keywords: Animal Waste, Biodiesel, Free Fatty Acid, Pre-esterification, Trans-esterification.

INTRODUCTION

Energy demand will still increase considerably in the upcoming years due to population growth and gradual rise in living standards, especially in developing countries. Thus, needs should double by 2050. To satisfy this demand, the energy sources will become more complementary than competitive. All energy options must be kept open to provide the most appropriate responses, at both environmental and economical point of view^[1]. Hydrocarbons will play a major role in the future, particularly in the transport and petrochemical sectors. They will remain difficult to substitute in the short and medium terms. Based on these conclusions, the technological solutions that will ensure the future energy needs and mobility should be developed by considering the finite nature of hydrocarbon resources and the problem of climate change. Thus, as a sustainable development perspective, it is necessary to ensure a long term energy supply, while protecting the local and global environment to reduce greenhouse gas emissions^[1]. All these factors make it necessary to research and develop sustainable renewable energy sources. Biomass sources, especially animal fats provided by slaughter waste, have attracted much attention as an alternative energy source. They are renewable, non-toxic and can be produced locally from agricultural resources and slaughterhouses. Furthermore, they emit less harmful emissions in the environment^[2]. Biodiesel is an alternative to petroleum based fuels derived from vegetable oils, animal fat and used waste cooking oil including triglycerides^[2]. Currently biodiesel is mainly produced from a wide range of edible vegetable oils (e.g. rapeseed, soy, sunflower, or palm oil). However, since these



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An Optimum Novel Design & Performance Analysis of Energy based Approach by using Phase Changing Materials

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Abstract: In this work, different PCMs are studied thermally and structurally, selected the optimum material and a practical application of personal usage of it (cooling vests) is fabricated and analyzed for its efficiency improvement. A new method and empirical design for the replenishment or recharging of the phase changing material used inside the vests is developed by circulating cooled water obtained by adopting peltier cooling, through the vest in a designed fashion, the conventional methods for which are practically difficult in day-to-day conditions. The fabricated vest can be used to maintain an optimum temperature ranging between 60°F to 83°F at high atmospheric temperatures.

Key words: Personal cooling, phase changing material, cooling vest, Latent heat

I. INTRODUCTION

A personal cooling system has become the need of the century as the global climatic changes are bringing unpredictable environment conditions to survive. Global temperature is rising steadily and researchers around the world are trying to come up with solutions. Massive research and development for personal cooling is being done by the military too. For instance, a soldier who needs to do his mission in a deserted area with temperatures going up to 130°F will find it thorny. If he/she can use a personal cooling attire to feel like 70°F instead of 130°F, then that is a definite need of the soldier. The same need of lessening fatigue is also very crucial in many other areas too such as athletics, high heat environments, and operating rooms. Different methods and concepts are being developed to develop such a personal cooling attire and one of the most discussed technique is the use of phase changing materials. A phase-change material (PCM) is a substance which is having a high heat of fusion, which melts and solidifies at a certain temperature, and it is able to store and release huge amount of energy. When the material changes from solid to liquid, heat is wrapped up or released and vice versa. And hence PCMs are classified as latent heat storage (LHS) units. Latent heat storage of PCMs can be obtained through liquid to solid, solid to liquid, solid to gas and liquid to gas phase transitions. However, the only phase change used for PCMs is the solid to liquid change as all other transitions have viability issues. This effect could be achieved by using phase change material (PCM). Phase change materials possess the ability to change their state with a certain temperature range. These materials absorb energy during the heating process as phase change takes place, otherwise this energy can be transferred to the environment in the phase change range during a reverse cooling process.

II THEORY

A. Working Principle Of Phase Change Materials

Thermal energy storage was at all times a really indispensable technique for thermal energy exploitation. There main four alternatives for thermal energy storage are latent heat utilization, sensible heat utilization, utilization of reversible chemical heat, and exploitation of heat of dilution. Solid, liquid, gas and plasma are the four states of a material. When a material converts from one state to another, it is called as phase change. There can be four kinds of phase change processes which are discussed here and are solid to liquid, liquid to gas, solid to gas and solid to solid. During the phase change process, heat is engrossed or released. Latent heat, is what we call this absorbed or released heat content. PCM which can convert from solid to liquid or from liquid to solid state is the most recurrently used latent heat storage material. It is suitable for the manufacturing of heat storage and thermo-regulated textiles and clothing. Modes of heat transfer are strongly depending on the phase of the substances engage in the heat transfer processes. Conduction is the predominate mode of heat transfer for substances that are solid. For liquids, convection heat transfer outweighs, and convection and radiation are the primary mode of heat transfer for vapors. The principles of solid to liquid phase change and liquid to solid phase change are to be discussed here. The phase change from the solid to the liquid occur when the melting temperature of a PCM is obtained during heating procedure. During this phase change process, the phase changing material absorbs huge quantities of latent heat from the surrounding area throughout the process. Phase changing material may be repetitively converted between solid and liquid phases to make use of their latent heat of fusion in order to absorb, store and liberate heat or cold. Phase change materials are not something new to us. They already subsist in various forms and various dimensions in our nature. Water at zero degree celcius is the most common example of a PCM that we can relate to in nature. Water crystallizes as it changes from liquid to a solid. A phase change also occurs when water is heated to a temperature near to 100°C, the point at which it becomes steam. During the actual phase change with the amount of heat absorbed in a regular heating process, water is something that can be made use for comparisons in order to put side by side the amount of heat absorbed by a Phase changing material.

B. Thermoelectric Cooling

To create a heat flux linking junction of two dissimilar types of materials, thermoelectric cooling uses the Peltier effect. A Peltier cooler is essentially a solid-state active heat pump which transfers heat from one side of the device to the other side. It burns up the electrical energy, depending on the direction of the current. Peltier device, it the name that we use for such an instrument. It



PRINCIPAL

Modification of Tailstock Design for the Purpose of Trepanning Operation in Heavy Duty Lathe

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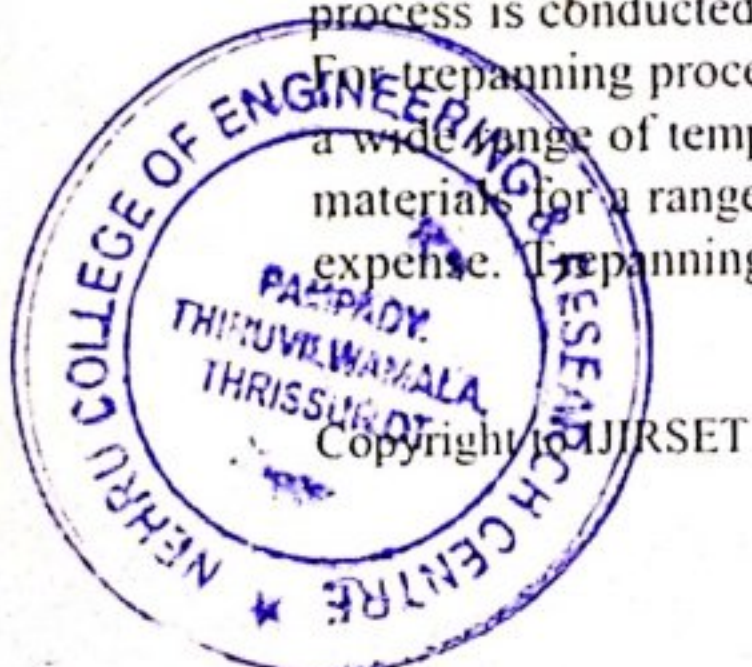
ABSTRACT: Trepanning is a drilling process that leaves a core. Trepanning is a deep hole drilling process that has broad application over many industries. A trepanning tool is a carbide cutting tool which is used as a metal cutting tool for varied materials where deep hole boring and cutting large diameters is needed. A trepanning tool creates an annular hole without cutting up to the centre and without removing the core material. Thus the wastage of material is reduced. Also trepanning process takes very less time for the operation. Trepanning tool normally have one carbide tip at the cutting edge, and they sometimes rely on water to cool down the cutting tips and remove chip from the hole being created. Selection of material for the trepanning tool and cutting tips are based on the properties of material to be machined. The purpose of the tailstock design is to conduct trepanning process on a Titanium rod. Trepanning process will help to reduce the wastage of raw material and to save the cost. A conventional type of lathe is used to hold the work piece. It is a heavy duty lathe with 2 tonne capacity and 1000mm holding capacity. The tailstock and the trepanning tool should be able to carry the load during cutting process. The tailstock design should be in such a way that the feed movement of the trepanning tool should be either by a hand wheel rotation or by a motor. The trepanning tool is designed to produce a pipe with inner diameter 170mm from solid shaft of diameter 210mm and 600mm in length.

KEYWORDS: Trepanning process, Titanium, Tailstock design Trepanning tool, Carbide tip

I. INTRODUCTION

Titanium and its alloys have gained widespread applications in aerospace, biomedical industries and marine due to their favorable properties. They are light weight, possess high strength, have excellent fatigue performance and offer high resistance to an aggressive environment. Titanium is a chemical element with symbol Ti and atomic number 22. One of the primary ingredients to successfully machining titanium is a stiff and rigid machine tool and work holder. It is critical that the machine tool and fixture are capable of securing the work-piece as it begins to vibrate, only those fixtures that have been designed with stability as its primary function should be used in titanium machining. Having a stiff and rigid machine design allows the machine tool to counter the high-torque, high-horsepower forces of the spindle and produce consistent part quality with less effort. A cutting tool must have good hardness, toughness and wear resistance in order to produce good quality and economical parts.

In the market standard titanium pipes are available. As per the customer requirement the size of pipe may get varied. If the pipe size doesn't belong to a standard size then trepanning process has to be conducted. Normally trepanning process is conducted on costly materials like titanium alloy. Trepanning reduces the waste and it gives the required size. For trepanning process it is always recommended to use Carbide tools for cutting process as it have high hardness over a wide range of temperatures, high thermal conductivity and high Young's modulus making them effective tool and die materials for a range of applications. Scope of this project is to manufacture a trepanning tool arrangement at very less expense. Trepanning tool helps to create bore on the solid material. The trepanning tool does not machine the whole



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Replacement of Grid Coupling with Bush Pin Coupling in Blower

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ABSTRACT: Couplings are used to connect the driving shaft to the driven shaft in rotating equipment. This direct connection will help for the transmission of power between the shafts. Grid couplings are type of coupling which is connected by means of metallic grid. This metallic grid takes up the load and will breaks down on overload conditions and misalignment conditions. Grid coupling will take up a misalignment of 3 mm, to reduce the failure rate of equipment due to the failure of grid coupling, bush pin coupling is introduced. It can take up a misalignment of 5 mm and will help in damping the vibration. All dimensions of bush pin coupling is calculated and analysed the same with ANSYS workbench 15

KEYWORDS: Coupling, Bush pin Coupling, Design and analysis

I. INTRODUCTION

A coupling is device used connect driving shaft to the driven shaft to transmit power. Coupling connects the shafts during operation. Coupling joints shaft with torque by allowing some misalignment. Or end movement or both.. Coupling used is grid coupling. Connecting two grooved discs or hub, one on the driving shaft and other on the driven side of the shaft. The teeth are cut axially around the hubs and is specially designed to suit a particular characteristics. The grooved hubs are connected together by means of flexible grid springs. The stiffness of spring is varies according to the unsupported length of each flexible span, and since this changes according to the changes in torque and vibration cycle

The work in this paper is divided in to two stages. 1) Study of failure in grid coupling 2) Design and analysis of Bush pin coupling.

II. RELATED WORK

Blowers are working 24x 7. It may have failure at any time. The main reasons for failure is failure of bearings and grid coupling. The studies have been done before for the analysis of failure in bearings and couplings. The frequent failure occurs in grid couplings. The grid coupling fails due to misalignment and over loading conditions. Vibration analysis are done to find out the points and cause of failures. As per the previous analysis done, it is found that misalignment is the root cause for coupling failure

The grid coupling can only withstand a misalignment of 3 mm. and we have to design a coupling which can withstand more misalignment than grid coupling bush pin coupling is the best option.



Finite Element Simulations of Ballistic Impact on Glass Fiber Composite

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Abstract: Conventional layup technique is used for manufacturing laminated polymer composite. By using this technique composite structures are prone to edge delamination. Wrap around technique is used for suppressing edge lamination problems. By using this technique composite properties will increase and delamination can be minimized. This results in increased life for the composite. Impact analysis is conducted on Glass Fiber composite under three different velocity on wrap around composites. From the results check whether the glass fiber composite can withstand at applied velocities. According to the analysis results implement glass fiber in the manufacturing of body armors

By analyzing stresses on glass fiber composite and use this material as alternative one for the manufacturing of civilian ballistic vests. Ballistic vests made by Kevlar and other types of bullet proof materials are very costly. In order to reduce this manufacturing cost and make vests more familiar to the civilians, a low cost vest material is to be introduced. Compared to military purposes civilian ballistic vests have low strength. The objective of this project is to replace the material used in manufacturing of civilian vest which will ensure safety and can be produced at low cost and easy manufacturing methods.

I. INTRODUCTION

Interlaminar fracture or Delamination of polymeric based structural composites is generally caused by high interlaminar stresses, that occurs due to mismatch in elastic properties between free edge and plies. Laminated composite structures manufactured by conventional lay-up technique are subjected to edge delamination. The presence and growth of delamination in composite laminates may lead to safety problems, such as reduction of stiffness, fatigue life and strength etc. Therefore, understanding the behavior of stress and delamination have critical importance in the analysis of structural behavior of composite materials and structures. Many investigators have studied free edge effects with delaminated composite laminates subjected to load because of the negative effect of delamination on the structural integrity. The delamination is found to be sensitive to laminate stacking sequence, fiber orientation, and ply thickness.

In present scenario all vests manufactures are trying to build them at minimum manufacturing cost as well as light weight. For this many experiments are being carried out for finding out a best solution. The above can be achieved by introducing good materials, good design concept and effective manufacturing process. Kevlar is a material commonly used to make bullet proof vests. Kevlar is not a economic product. This will cause high manufacturing cost.

II. PROBLEM STATEMENT

Conventional layup technique is used for manufacturing laminated polymer composite. By using this technique composite structures are prone to edge delamination. Wrap around technique is used for suppressing edge lamination

III. OBJECTIVE

Composite material plate was analyzed using FEM technique to know high velocity impact analysis of plate. Ansys software was used to find out the result. The analysis of composite materials with high cost and limited amount of data from impact testing has lead to ballistic tests expensive and time consuming. In order to ignore this issue, finite element analysis can be used as a method to find out the response of ballistic composite material and to obtain parameters affecting impact phenomena. The main focus of this research work is to study the response of thick plate made of composite material at a high velocity impact by using finite element analysis.

IV. MATERIALS AND METHODS

A composite material is defined as a combination of two or more chemically or physically distinct constituents in a macroscopic level. The constituents present in the composite material should maintain their individual identities and properties, but together they produce a new material, the properties which are to be superior to those of the constituent materials.

A. Glass Fiber

Fiberglass is a type of fiber reinforced material where the fiber reinforcement is glass fiber. The glass fiber may be flattened into a sheet, randomly arranged or woven into a fabric. The most often plastic matrix are epoxy, polyester resin or vinyl ester. Depending upon uses of glass fiber various types are manufactured. These glasses all contain boron, silica or silicate and sometimes with varying amounts of oxides of calcium, magnesium, . To be used in body amour, glass fibers have to be made with very low amount of defects.



An Optimum Novel Design & Performance Analysis of Energy based Approach by using Phase Changing Materials

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Improved security system for ATM using finger print identity

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Abstract —Today security of data is a major issue. This paper proposes a simple method using DWT for fingerprinting digital images. Algorithm presented locates regions that are insensitive to human vision so that presence of embedded identification code is fully concealed from the human eye. Frequency domain technique adopted improves the robustness of the scheme. The fingerprinting information is hidden to enable reliable detection even if the image is subjected to cropping or editing. As the fingerprint of every person is unique and cannot change by anyone, this biometric feature is used over the others. This system achieves high image quality in terms of MSE and PSNR.

Keywords - image watermarking, embedding, extraction, application of method.

I. INTRODUCTION

Digital watermarking is the act of hiding a message related to a digital signal. The process can be either visible or invisible. Visible watermarking declares some information regarding the ownership or displays a logo. Whereas invisible watermarks remain concealed from the human visibility and yields the hidden contents whenever an extraction process is carried out to discover the whereabouts of true owner of the resource.

Digital fingerprinting is one of the applications of watermarking. In digital fingerprinting the unique information assigned to identify the owner is embedded into the multimedia content. Fingerprints are unique to the owner of the in nature and hence different copies of an image carry different fingerprint depending upon the custodian.

Based on the technique used for embedding the image digital watermarking can be classified into spatial domain methods and frequency domain methods. The frequency domain methods are more popular because watermark embedding is very robust in this domain as compared to spatial domain. It provides more security and imperceptibility.

II. LITERATURE REVIEW

In this section, we briefly review some of the watermarking methods.

The scheme presented in [1] ensures the security against the image processing attack. In this algorithm MSB of the secret image embedded in to LSB of cover image. In this n LSB of cover image from a byte is replaced by n MSB of secret image. The quality of the image can be greatly improved with low extra computational complexity.

Another coding technique presented in [2], data inserted in images by simple MSB substitution. The method uses of most significant bit (MSB) algorithms for hiding data into digital images. The password is used for purpose of secret for encryption and decryption. The only authorized users can hide and disclose the message.

The decomposition technique presented in [3], first decomposes an image into sub blocks and then the resulting image is compared with a PSNR and MSE value

III. PROPOSED TECHNIQUE

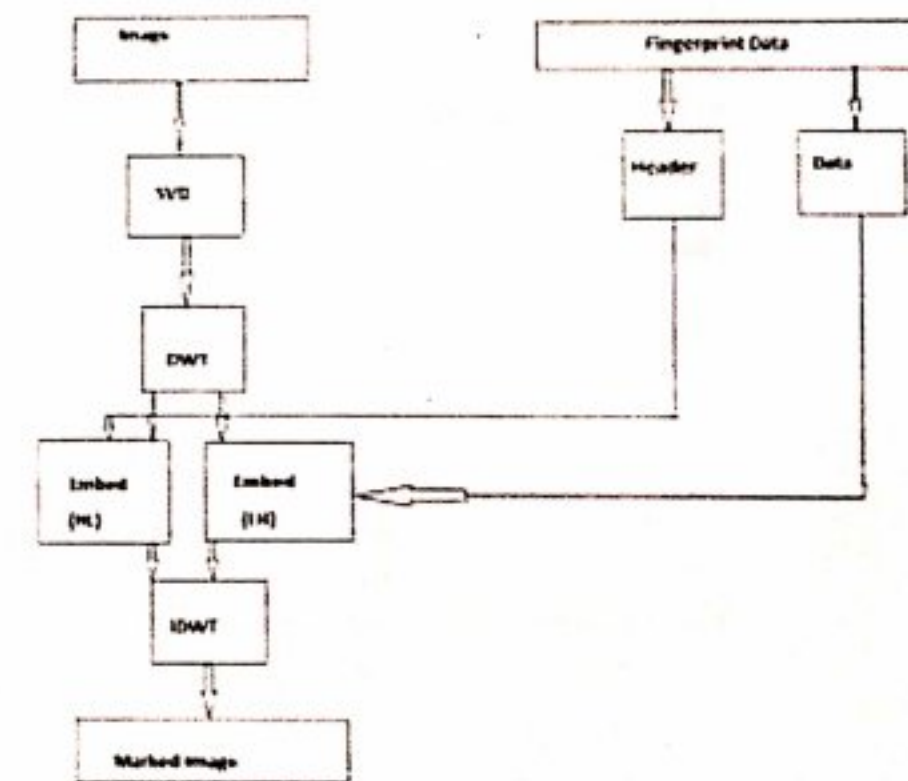


Fig.1 Embedding Process

The proposed technique combines embedding and extraction process.



A DSRC Transceiver with Multi Mode Encoder using SOLS Technique

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Abstract: An intelligent transportation system (ITS) is a technology, a platform or application that efficiently improves the quality of vehicle transportation. To promote the intelligent transportation system into our daily life, we can make use of the dedicated short range communication (DSRC) technique in the field of automobile industries. The FM0 and Manchester codes are used to reach the dc-balance in dedicated short range communication systems. The diversity between the FM0 and Manchester codes seriously limits the area utilization and power consumption. In the proposed system SOLS technique is used to overcome this limitation. In this project, an efficient DSRC encoder and decoder is proposed with ASK modulator with minimum area utilization with the help of similarity oriented logic simplification technique.

Keywords - Dedicated short-range communication (DSRC), FM0, Manchester, VLSI.

I. INTRODUCTION

The dedicated short-range communication (DSRC) is a protocol specially designed for the intelligent transportation system, in which the communication between each and every vehicles may be one way or two way communication. The DSRC consist of both vehicle to Vehicle (v2v) communication as well as vehicle to roadside infrastructure (v2r) communication. The vehicle to vehicle communication mainly deals with the forward collision warning, emergency electronic break light, blind spot or lane change warning, do not pass warning etc. At the same time the vehicle to infrastructure communication includes the Electronic Toll Collection (ETC), curve speed warning, red light violation warning, spot weather information warning, reduced speed zone warning, stop sign gap assistance etc.

The DSRC transmission system architecture consists of three modules. For the transmission and reception of data, the RF front end can be used. The overall system process controlling and task scheduling is done with the help of a microprocessor. The main part of the DSRC transceiver is the baseband processing. The major function of the baseband processing includes modulation, error

correction, clock synchronization, and encoding or decoding. When the channel is in idle condition, there may be the chance of occurrence of noise. This chance will reduce with the help of FM0 or Manchester encoding technique.

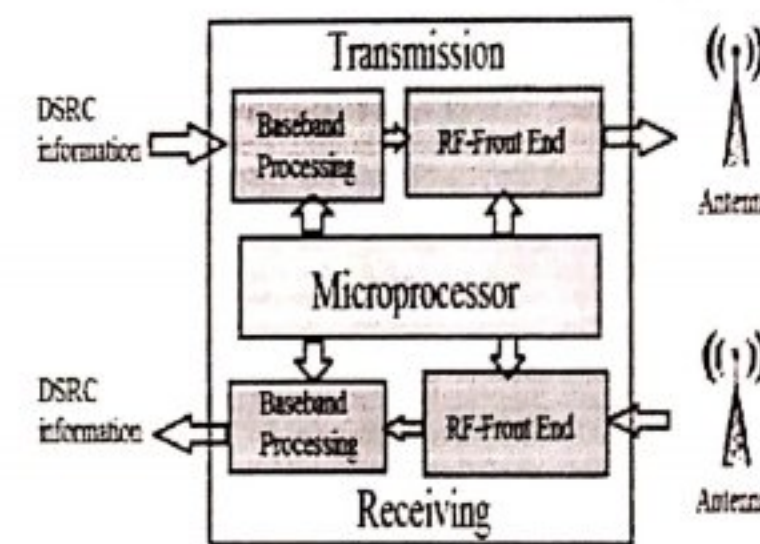
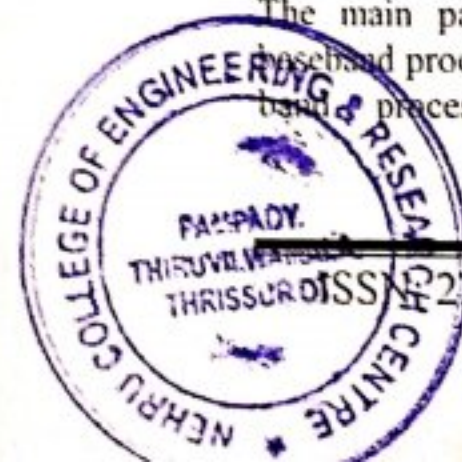


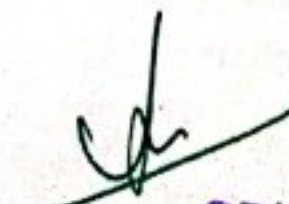
Fig. 1 System architecture of DSRC transceiver

The hardware usage become more and this will affects the performance of the proposed system if we implement the design for FM0 and Manchester encoder separately. So to improve the hardware utilization ratio of the system, a new architecture is proposed through this project called the Similarity Oriented Logic Simplification (SOLS). This technique also improves the performance and area utilization.

Several organizations in different countries have been developed this system. The DSRC standards of America, Europe, and Japan are shown in Table I.

The carrier frequency of 5.8 and 5.9 GHz individually targets the data rate of 500 kb/s, 4 Mb/s, and 27 Mb/s in various countries, here the most common modulation technique is Amplitude Shift Keying and the encoding technique is Manchester or FM0 encoding.




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Dynamically Reconfigurable RISC Microprocessor design using MIPS Instruction Set

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Abstract: Today's world suggests multifunction in each products. This paper design a RISC processor using MIPS instruction set architecture which supports multifunctioning. Dynamic Reconfiguration refers to the ability of the Processor to update its internal Instruction Decode and Execute stage in order to support new functions, while the system is running. This project presents a principle on how performance can be improved in the context of microprocessor Units applications, using the MIPS instruction set.

Keywords - RISC, MIPS, dynamically reconfigurable.

I. INTRODUCTION

MIPS can be abbreviated as Microprocessor without Interlocked Pipelining Stages. It was first developed by Sony, Nintendo and NEC. It was developed to overcome the problems of the conventional design i.e. using same instruction set for all the applications makes instruction set busy and system a delaying system. MIPS processor core assigned different formats for certain instructions for their easy implementation.

RISC CPU have more advantages, such as reduced number of instructions, faster speed, and simplified structure easier implementation. RISC CPU is extensive use in embedded system. RISC processor has a load store load instruction.

This paper is a zoom in on how the MIPS instruction Set is embedded in an RISC Processor by increasing the performance.

II. LITERATURE SURVEY

In this section we briefly review some of the works of designing RISC static processors.

In the scheme presented in [1] ensure the power reduction of a RISC processor .Here they created a RISC processor using MIPS architecture .They included clock gating and multi Vt technique to reduce the power. They have also incorporated hazard detection unit to remove the hazards if any.

In the paper [2] a RISC processor has been designed in FPGA. They adopted top-down design method and use VHDL to describe system. They analyzed MIPS instruction format, instruction data path, decoder module function and design theory based on RISC CPU instruction set.

In the section [3] Stall in MIPS architecture has been reduced to maximum. Stall frequently happens in pipeline architecture which results in larger clock cycles. Here they reduced stall by introducing pre-fetching unit.

Another work [6] propose a 16-bit non-pipelined RISC processor, which is used for signal processing applications with 24 instruction set.

III. PROPOSED WORK

A. MIPS PROCESSOR ARCHITECTURE

Architecture of MIPS RISC microprocessor includes, fix-length straight forward decoded instruction, memory access is limited to load and store instruction format, a large general purpose register file.

The 32 bit RISC MIPS processor has 5 stages. ...

1. Instruction fetch (IF)
2. Instruction Decode (ID)
3. Execution (EXE)
4. Data memory (MEM)
5. Write back (WB)

The MIPS single cycle processor performs the tasks of instruction fetch, instruction decode, execute and memory access and write back all in one clock cycle.

The architecture of RISC processor is shown in fig 1 with all the 5 Stages. Pipelining improves the performance of the processor




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SAHS Detection Based on ANFIS Using Single Channel Airflow Signal

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ABSTRACT: The aim of this paper is to present an efficient and accurate detection algorithm for Sleep Apnea-Hypopnea syndrome (SAHS) based on the single-channel airflow (AF) signal. SAHS is a sleep disorder which happens due to the infrequent breathing during sleep or pauses in breathing. Studies show that 80% of patients remain undiagnosed and untreated, which could lead to stroke, heart attack, hypertension or depression. The nasal airflow signals extracted from polysomnography recordings are obtained from PhysioNet apnea-ECG database. The features of the signals are extracted using wavelet transform method. To derive an optimum set of features with minimum redundancy, a mutual information based feature selection method is applied. The features obtained from 8 recordings are used for classification of SAHS by using two classifiers such as AdaBoost (AB) and adaptive neuro fuzzy inference system (ANFIS). Training and testing process have been repeated by using randomly obtained six sequences of whole data. According to the results, the classification accuracies have been obtained as 98.43% and 98.68% respectively. Therefore ANFIS based classification has increased degree of accuracy when compared to AdaBoost. As well as the use of single channel input makes the real time SAHS detection easier and less complex. So this method can be a valuable solution for saving undiagnosed SAHS patients without disrupting their daily life activities.

KEYWORDS: Sleep apnea-hypopnea syndrome, AdaBoost, Airflow signal, Wavelet, Mutual information, Adaptive neuro-fuzzy inference system.

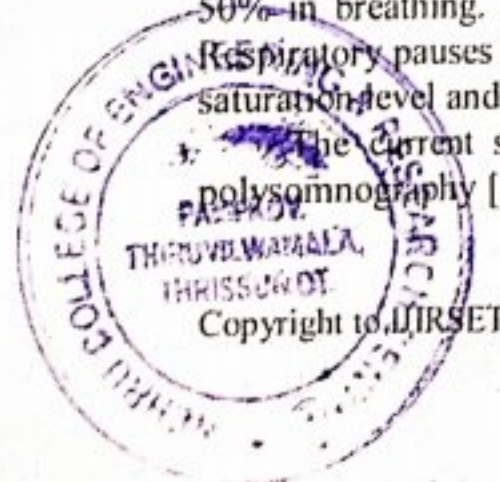
I. INTRODUCTION

Sleep Apnea-Hypopnea Syndrome (SAHS) is a most common sleep-related breathing disorder. It is characterized by the repeated occurrence of involuntary episodes of reduction in respiration due to partial or total collapse of the upper airway while asleep [1]. Studies have been conducted around the world over the last few years, which have estimated that approximately 4% of men and 2% of women of the age of 30 to 60 years suffer from SAHS [2]. And 80% of patients remain undiagnosed and untreated for many years as they are unaware of their own symptoms [3]. Undiagnosed SAHS patients have risk factors of automobile and industrial accidents, cognitive impairments, stroke and cardiovascular diseases [4] [5]. Common symptoms of SAHS include snoring, daytime sleepiness, depression, tiredness and low concentration [6] [7].

A patient suffering from SAHS has respiratory pauses that repeat throughout the night. The duration of this pauses vary with depends upon patient health condition. Common duration of the apnea event is about 20 to 40 seconds [8]. A hypopnea is defined as a respiratory pause that meeting the duration with an associated reduction around 30 to 50% in breathing. In the case of apnea, the associated reduction is about 90% or even totals breathing cessations.

Respiratory pauses associated with the presences of an apnea event are usually lead to significant reduction in oxygen saturation level and causes arousals. This fall is proportional to the causing airflow reduction [10] [11].

The current standard diagnostic procedure to determine the presence of SAHS requires an overnight in-lab polysomnography [12]. This involves the recording of several physiological signals such as Electrocardiogram (ECG),



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Prediction of Freezing of Gait (FOG) Episodes in Parkinson's Disease patients by Gait Analysis

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ABSTRACT: Freezing of Gait (FOG) is an incapacitating gait disorder in Parkinson's disease (PD) patients that manifests as disruptions in walking with an abrupt and transient nature. Eventhough the patients with earlier stages of PD have been reported experiencing FOG, it becomes more frequent in later stages of PD. It is very exhausting and decrease the quality of life of PD patients. If FOG can be effectively detected before it happens, external cues can be provided to aid the patients to avert the freezing phenomenon. The proposed method analyses the accelerometer signals using wavelet decomposition and extract significant features to train the classifier to accurately predict the FOG episodes.

KEYWORDS: Freezing of gait (FOG); parkinson's disease (PD); gait analysis; accelerometer; gait disturbance.

I. INTRODUCTION

Parkinson's disease (PD) is a neurodegenerative disorder that results from the progressive loss of dopaminergic neurons and other sub-cortical neurons [3]. The dopaminergic neurons produce dopamine which is responsible for the normal movements in humans. So the degeneration of these neurons impair movement and manifest as resting tremor, bradykinesia, a forward stooped posture, postural instability, rigidity, and freezing. The cause of PD is unknown (idiopathic), and although there is no complete cure, there are treatment options like medications and surgery available to manage the symptoms. Around 10 million people in the world are suffering from PD. Age is considered to be one of the most important risk factor. As the quantity of elderly people increase in the society, PD is considered to be a major health problem and the number of patients with parkinsons (PWP) may increase in the future years.

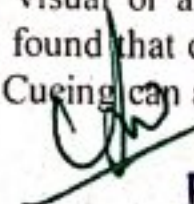
Gait and balance disorders are a major therapeutic challenge in PD. These symptoms respond poorly to dopaminergic treatments, except in the early stages of the disease [2]. Freezing of gait (FOG) is one of the typical symptom that is more prevailing in the later stages of PD and is more than just a sign of advanced parkinson's disease. It is defined as, "a brief, episodic absence of marked reduction of forward progression of the feet despite the intention to walk". During FOG the patients' gait is halted with a feeling of "the feet being glued to the ground"[1]. FOG lasts for less than a minute, but unlike normal people they experience: start hesitation, turn hesitation, hesitation in tight squares-FOG through narrow space, destination hesitation, and open-space hesitation [4].

Falls occurring in patients with advanced PD can be related to FOG. As the disease progresses the shaking or tremor, freezing and other symptoms may begin to interfere with the daily life and It significantly reduces the quality of life. Above 40% of patients with postural imbalance have multiple falls that can often lead to injuries and fractures that need medical care. It reduces the productivity and the fear of walking results in social isolation [5].

The factors commonly induce FOG are turning, fatigue, confined spaces, stressful situations, and emotional since dopaminergic treatment partially assauges FOG, there are other strategies are developed to help the patients to overcome it. Somatosensory cues have been found to improve walking, with visual or attentional cues proposed to have impact, followed by tactile, emotional and auditory cues [6], [8]. It is also found that demand cueing (only when FOG episodes are detected) is more efficient than continuous cueing [7]. Cueing can also be used to address other mobility problems such as gait initiation failure and shuffling [6].



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Moving Object Detection and Tracking Using Hybrid Model

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Abstract—Multiple moving object detection in videos is very important in many video processing applications like video surveillance, monitoring traffic for rash driving control, detections of pedestrians etc. This detection must be performed accurately and robustly to minimize the false alarms and missing evidences. Background modelling and foreground extraction are two major processes to achieve this goal. Many traditional background modelling methods use either colour information or texture information. But colour is sensitive to light variations and texture information cannot be utilized to separate smooth foreground from smooth background in many cases. To achieve good performance in terms of high foreground detection accuracy and low computational cost is also challenging. A new hybrid model with integration framework of texture and colour information for background modelling is proposed in this project. This framework is able to combine the advantages of both colour and texture methods, and at the same time it cancels out their disadvantages as well. Moreover, we propose a block based method to accelerate the background modelling. The background and foreground models are updated by first in first out strategy to maintain the most recent observed background and foreground instances. Along with this it is necessary to track the detected objects in real time, to enable corrective actions. We are using active contour model based tracking. An extensive experiment on various challenging videos and comparison of various parameters like Precision, Recall, F-measure and Processing time which proves the effectiveness of the proposed method over existing ones.

Keywords—Object detection, integrated information, colour information, texture information, background subtraction, block based detection, hybrid model.

I. INTRODUCTION

Moving object detection usually serves as pre-processing for higher-level video analyses and its performance directly affects the performance of the subsequent applications. For object tracking, if a moving object is detected as two or two moving objects are detected as one, the tracking result may be incorrect. For object categorization, incomplete or adhesive detection of moving objects may lead to wrong categorization, and it is the same case for object re-identification. For video condensation, object tracking is also an indispensable part. It is not the desired result if the head and legs of one person appear at different time in the condensed video. Ideally, a detection method should detect each moving object separately without breaking.

Background modelling is indispensable for moving object detection in many cases and lots of works have been done in this research area. In early works, the background model was constructed for each pixel independently. Until now, only a few works have been done on block based background

modelling or background subtraction. The advantage of the block-based strategy over the pixel based one is that stable foreground detection results can be achieved with less computation and memory resource. While the disadvantage is that the detection boundary will be very coarse, and adjacent moving objects may be connected.

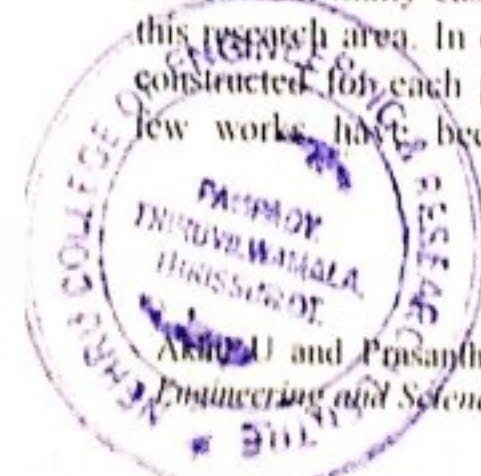
Colour information is sensitive to illumination variations while texture information cannot be utilized to separate smooth foreground from smooth background in most cases. In this work, we propose a new integration framework of colour and texture information which can inherit their advantages while inhibiting their disadvantages. Since background modelling is usually a pre-treatment for higher-level video analyses, it should be computationally efficient. So we use the block-based strategy and construct one model for each block, which is different from the pixel based strategy that has one model for each pixel. A lot of computational resources can be saved. As aforementioned, the block based method has a shortcoming that the detection boundary will be coarse and may connect adjacent moving objects. To deal with this problem, we use two levels of block sizes. Background models are constructed in big blocks for stability while detection decisions are made for small blocks to achieve finer boundary.

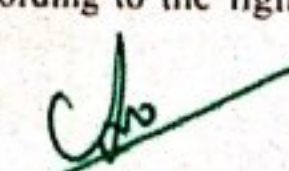
The main contributions of this paper is as follows. Firstly, a new integration framework of texture and colour information is proposed and both illumination variations and smooth background-foreground problem can be handled. Secondly, the block-based strategy is used and a single histogram model is established for each block, which makes our modelling process fast with little memory consuming. Thirdly, two levels of block sizes are used to benefit from the fact that the background model in big blocks can be more stable while the final foreground detection boundary based on small blocks can be more accurate.

II. OVERVIEW OF THE SYSTEM

In proposed system the main aim is to build robust moving object detection algorithm that can detect and Track object in video. The first step is to take input video from static cameras. For processing the video files, convert video into frames and from frames to images. Next step is take first frame as a Background frame and next is current frame and then apply subtraction operation. Background frame is subtracted from current frame. Then Threshold operation is performed and foreground object is detected. After object detected last step is track object in video.

By using dynamic threshold method we can dynamically change the threshold value according to the lighting changes




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An Improved Performance of 2D ASCO-OFDM in Wireless Communication

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Abstract— This paper describes a novel modulation scheme of asymmetrically and symmetrically clipping optical (ASCO)-OFDM into two dimensional (2D) intensity modulation direct detection (IM/DD) optical wireless communications (OWC). The asymmetrically clipping optical (ACO)-OFDM symbols and the symmetrically clipping optical (SCO)-OFDM symbols are mapped into odd columns and even columns of transmitted matrices respectively. Due to an ASCO-OFDM signal consists of an ACO-OFDM signal and a SCO-OFDM signal, the average data rate of ASCO-OFDM is higher than that of ACO-OFDM. An improved receiving technique for the asymmetrically and symmetrically clipping optical (ASCO)-OFDM is developed for wireless communication system. Analysis found that the interference caused by clipping only affects the symbols on the even subcarriers. At the receiver, the ACO-OFDM symbols can be easily obtained by detecting the data on the odd subcarriers; the SCO-OFDM symbols can be successfully recovered by subtracting the estimated ACO-OFDM clipping noise and the SCO-OFDM clipping noise from the even subcarriers. The ACO-OFDM clipping noise is estimated from the received ACO-OFDM signals, and it can be reused to decrease the symbol error rate (SER) of ACO-OFDM signals. The SER of SCO-OFDM signals depend on the precision of ACO-OFDM signals. Thus, we apply an improved ACO-OFDM receiving technique in our current receiver to further improve the SER performance of SCO-OFDM signals as well as that of the whole system. We show that the spectral efficiency of 2D ASCO-OFDM is twice as much as that of other OFDM modulation schemes. The major problem of OFDM high Peak-to-Average power ratio (PAPR) is reduced by 2dB. The channel capacity of ASCO-OFDM in AWGN channel is calculated. The symbol error rate (SER) performance of 2D ASCO-OFDM is simulated under the environment of additive white Gaussian noise (AWGN) and it exhibits better SER performance than 2D ACO-OFDM and 2D ADO-OFDM in the same bit rate case.

Keywords— ACO-OFDM, ADO-OFDM, ASCO-OFDM, IM/DD, OFDM, OWC, SCO-OFDM, SER.

I. INTRODUCTION

Optical wireless communication (OWC) has been widely studied in recent decade because it can be an effective alternative to radio frequency communication (RFC) for indoor wireless applications. Intensity modulation and direct detection (IM/DD) can be simply implemented into optical wireless systems. The information stream is modulated into the intensity of optical carriers, and the optical signals are transmitted by LED emitters. The intensity variation of optical signal will be detected by a photodiode and the received optical signals are converted to electrical signals for decoding. However, most experiments are developed over single-input single-output (SISO) systems. In the meantime, the two dimensional (2D) optical wireless system, which is a form of multiple input multiple-output (MIMO), also has been studied

and they are getting more and more attentions.

Orthogonal frequency division multiplexing (OFDM) has been extensively applied into IM/DD optical wireless systems because it is capable of combating the inter-symbol-interference (ISI) caused by multipath transmission, especially in an indoor environment. As we adopt IM/DD to realize the transmission and reception, the optical signals must be real and non-negative. In order to obtain real signals, blocks of complex symbols in the frequency domain must be constraint to Hermitian symmetry. Then two modulation schemes, asymmetrically clipping optical (ACO)-OFDM and DC biased optical (DCO)-OFDM, have been adopted to make the real signals non-negative in one dimensional (1D) optical systems. Also, these two techniques have been investigated in 2D optical wireless systems. By adding an appropriate DC bias to remove the negative values. However, it has been shown that DCO-OFDM is not optical power efficient, and the performance highly depends on the DC bias level in 1D OWC. ACO-OFDM is much more optical power efficient than DCO-OFDM, but it requires twice bandwidth as much as DCO-OFDM does. Additionally, the ACO-OFDM transmitted signals inherently have a large PAPR.

Asymmetrically and symmetrically clipping optical (ASCO)-OFDM is an improved clipping OFDM modulation scheme for optical wireless systems. We first map ACO-OFDM symbols onto the odd subcarriers. In order to improve the bandwidth efficiency, SCO-OFDM symbols are modulated onto the even subcarriers. A transmitted ASCO-OFDM signal is the sum of an ACO-OFDM signal and a SCO-OFDM signal. Since the clipping noises fall onto the even subcarriers without distorting the odd subcarriers, we can directly detect the symbols on the odd subcarriers to recover ACO-OFDM symbols. After subtracting the estimated ACO-OFDM clipping noise from even subcarriers, we finally obtain the SCO-OFDM symbols. This scheme, ASCO-OFDM, not only improves the bandwidth efficiency but also reduces the PAPR of transmitted optical signals. Here we apply ASCO-OFDM into 2D optical systems to improve the performances in terms of the PAPR and SER.

II. SYSTEM MODEL AND ASSUMPTIONS

A. 2D ACO-OFDM

The block diagram of a 2D ACO-OFDM system is shown in figure 1. Blocks of electrical symbols drawn from constellations, such as 4-QAM, 16-QAM, and 64-QAM, are input to the system. Conventionally, the symbols are mapped into a signal vector in 1D optical wireless system. In the 2D case, the input symbols are mapped into $N_1 \times N_2$ signal matrix

Development of NFC Based IAP For Wireless Sensor Nodes

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Abstract: In a large scale WSN deployment, reprogramming the WSN nodes with new firmware using In-System Programming (ISP) by opening the enclosure of WSN node will be a tedious job. Instead, reprogramming could be achieved by providing physical access to JTAG/SWD on the enclosure; but it will compromise the Ingress Protection (IP) rating of WSN node. Hence, Wireless based In-Application Programming (IAP) could be preferred. Near Field Communication (NFC) is a secure and promising short distance radio communication technology. This paper presents how an NFC transceiver can be utilized to program the microcontroller of WSN nodes. It also explains the development of boot loader program for WSN node to support wireless based IAP.

Keywords: Wireless Sensor Network, In-System Programming, Wireless based In-Application Programming, Near Field Communication.

I. INTRODUCTION

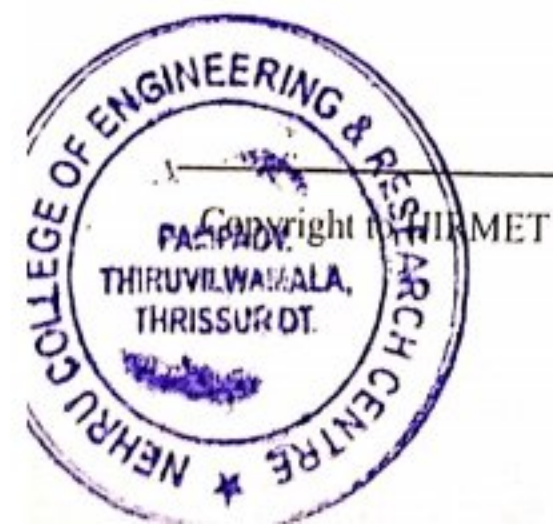
Wireless Sensor Network (WSN) consists of several sensor nodes each connected to one or more sensors. These nodes transmit sensed data towards the basestation via a meshed network of routers. Generally, WSN is used for industrial monitoring, health care monitoring, environmental/earth sensing like air pollution monitoring, forest fire detection, water quality monitoring etc. [1]. Basic characteristics of the wireless sensor network are limited energy, multi-hop routing, dynamic network topology, node failure tolerance and mobility of the nodes with short-range broadcast communication [2].

Sensor node comprises of microcontroller, radio transceiver unit and signal conditioning circuit unit. Auxiliary units like external memory, RAM, ADC could be present based on the application requirement. Usually, batteries, both rechargeable and non-rechargeable, are the main source of power supply for sensor nodes. Energy harvesting techniques such as solar power, wireless power transfer (WPT), etc. are used to charge rechargeable batteries.

Microcontrollers in the sensor node can be programmed using ISP/JTAG. Microcontrollers that support ISP possess an internal circuitry to generate required programming voltage from the normal supply voltage of the system and to communicate with the programmer through a serial protocol using clock and data pins.

To facilitate easier integration with automated testing procedures, most of the programmable logic devices use a variant of the JTAG protocol. JTAG allows device programmer hardware to transfer data into internal non-volatile device memory. JTAG programmers also write software and data into flash memory.

Large scale or wide area deployment of WSN includes sensing of large number of physical parameters where continuous monitoring and situation analysis are of great interest. In such situations, reprogramming the microcontrollers using JTAG/ISP by opening the enclosure of sensor node will be difficult. For instance, to ease the reprogramming, if we provide physical access to microcontroller pins outside the enclosure of sensor node, it not only violates the ingress protection rating, but also breach security. So, Wireless based In-Application Programming (WIAP) is chosen to reprogram the microcontroller which is the combination of IAP and a short range wireless communication technology, NFC in our case.





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Design of Efficient Multiplier to Mitigate
Performance Degradation Caused by Aging
Effects

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ABSTRACT: The need of any VLSI circuits is high speed computation, low power and high performance and less area. Aging effects degrade multiplier speed, and in the long term, the system may fail due to timing violations. This paper introduces a high performance multiplier design that considers the Aging effect using Aging Aware block. The proposed design is implemented using a multi precision Column bypass multiplier. The experimental results show that our proposed architecture with multi precision column bypassing multipliers performance improvement, compared with variable-latency column bypass multiplier and fixed-latency column-bypassing multiplier.

KEYWORDS: Aging Aware block, Aging effects, Multi precision, Dynamic voltage and frequency scaling, Parallel processing, Variable latency, Timing violation, High Performance, Column bypassing multiplier.

I. INTRODUCTION

Digital multipliers are among the most critical arithmetic functional units in many applications such as the Fourier Transform, Discrete Cosine Transforms, and digital filtering. Arithmetic functional units in many applications, such as the Fourier transform, discrete cosine transforms, and digital filtering. The through put of these applications depends on multipliers, and if the multipliers are too slow, the performance of entire circuits will be reduced, because the multiplier is generally the slowest element in the system. Hence, the multi precision variable-latency design is proposed to reduce maximum power consumption, area and timing waste of traditional circuits paths. The bit width of the multiplier is same as that of the bit width of the largest operand of the application that the processor executes. But most of the times the operands do not occupy the maximum width and utilizes the resources unnecessarily which results in power loss. Combining MP multiplier with DVS can provide a dramatic reduction in power consumption by adjusting the voltage according to circuit's run-time, workload rather than fixing it to cater the worst case situations. The variable latency technique divides the circuit into two parts, they are, the shorter paths and the longer paths. Shorter paths can execute correctly in one cycle. In case of the longer paths, it needs two cycles to execute. When shorter paths are activated frequently, the average latency of variable-latency designs is better than that of traditional designs. Latency is the delay from input into a system to desired outcome. Also, it is well known that multipliers consume most of the power in DSP computations. Hence, low power column-bypassing multipliers and have been proposed to reduce the number of delay as well as power consumption. The delay and power reduction depends on the input bit coefficient. This means that if the input bit coefficient is zero, corresponding row or column of adders need not be activated. Furthermore, negative bias temperature instability (NBTI) occurs when a pMOS transistor is under negative bias

($V_{gs} = -V_{dd}$). The corresponding effect on an NMOS transistor is positive bias temperature instability (PBTI), which occurs when an NMOS transistor is under positive bias. Compared with the NBTI effect, the PBTI effect is much smaller on oxide/poly-gate transistors, and therefore is usually ignored. To mitigate the aging effects occurring in the PBTI Adaptive Hold Logic is used here.



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A NOVEL RANGE FREE LOCALIZATION METHOD FOR MOBILE SENSOR NETWORKS

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ABSTRACT

This Range free localization methods are commonly used in mobile sensor networks as they have many advantages over other methods. They are of low cost. They don't need more complex hardwares. But this type of localization also have some bad effects like more power consumption at nodes, which reduces network life time. And as a result communication cost is very large. For solving these problems, in this paper, the localization is done using beacon signals, anchor nodes, sensor nodes and Received Signal Strength(RSS). By using these parameters, a novel low cost localization method is introduced. This reduces the communication cost and network lifetime is improved. Theoretical analysis and simulations are done. Coding is done in NS2. The simulation and calculations shows that this method has more accuracy than previous methods.

Key Words: Mobile Sensor Networks, Anchor nodes, Beacon signals, Received Signal Strength.

1. INTRODUCTION

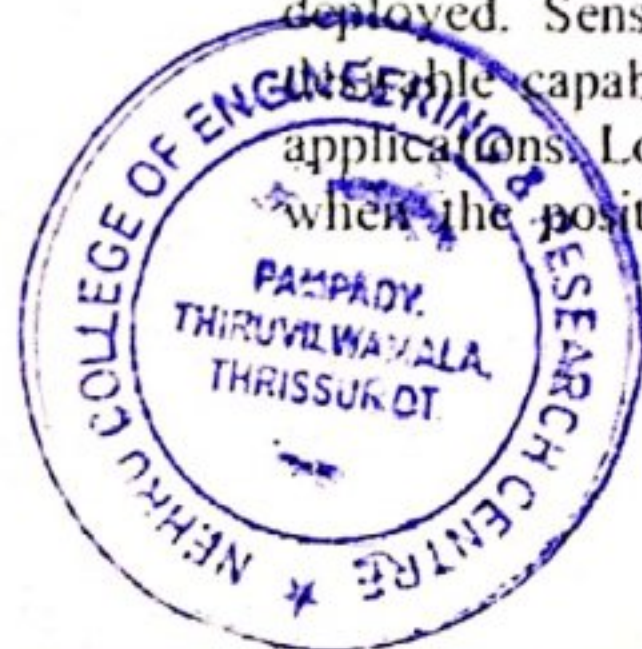
Today, mobile sensor networks are used for different applications. as technologies are becoming more and more smarter. Some of the areas where these mobile sensor networks are used are hazardous areas, remote areas or when large number of sensor nodes have to be deployed. Sensor node localization is a highly desirable capability for wireless sensor network applications. Localization issue is very important, when the position of nodes are unknown. It is

inevitable to find the most apt method to find the location of the nodes. So an efficient localization algorithm can then use all important parameters to find the position. The aim of this paper is an effective localization algorithm for mobile sensor nodes. The algorithm should be applicable to all nodes. Also should use almost all data from the network and calculate the location. Since the algorithm should be run in individual nodes, the method must be relatively simple and the resources must be limited. The performance of localization algorithms will depend on critical sensor parameters like radio range, density of nodes, anchor to node ratio. And it should be noted that the solution gives adequate performance over a range of reasonable parameter values and also in worst environmental conditions.

Localization is a process of estimating coordinates of mobile sensor nodes in a network based on various parameters and with the aid of a number of anchor nodes whose locations are already known by using GPS. An anchor node broadcasts beacon signals with limited information in it, so that transmission is easy and faster. These anchor nodes are required for localization in a global coordinate system. The location information of an anchor node can be acquired by using localization systems such as Global Positioning System (GPS) receiver[1].

There are a lot of reasons for the importance of this localization. For example, sensor location information can be used for tagging sensory data, which is important for environmental monitoring and military surveillance applications. The operation of a sensor network relies on sensor location information for uncovering and healing coverage holes in the network. Sensor location information

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ASMB (Advanced Smart Media Box)

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Abstract - Smart TV is one which can connect to internet and can stream media from internet. Buying a brand new smart TV is a very expensive. In this project a system is introduced that can be able to turn an old CRT TV into a Smart TV. It is just like a digital photo album to do a slideshow of photos from USB storage or from an online repository like Dropbox, Picasa, Flickr etc. It can play music, videos and play some cool games from USB storage. The smart TV can be controllable by an android phone. It has many features like Screen mirroring, a mini web server, it has the ability of voice recognition and it plays like a language translator. It also acts as a DLNA server for accessing files over the DLNA supported phones. Raspberry pi is used in this project which is a credit-card sized general purpose Linux computer designed and manufactured by the Raspberry Pi Foundation. The Pi features a system-on-a-chip setup built around the Broadcom BCM2836 processor (a tiny but fairly powerful mobile processor commonly used in cell phones) that includes a CPU, GPU, audio/video processing, and other functionality all on a low-power chip.

Key words: Smart TV, Raspberry pi, DLNA, HDMI, USB

I. INTRODUCTION

The current trend to move to web-based television has challenged the traditional television value chain by allowing any IP-based network, wired or wireless, to deliver high quality television content. Smart TV is an advanced form of legacy TV and has been discussed as one of promising devices for Post PC. Up to now, Smart TV is gradually changing its system architecture by adding functions to increase its usage and coverage. The suggested project is a new platform design to add more flexibility and to cover weak points of the previous systems. Consequently, the rapid adoption of web-based TV applications is fuelled by user demands for social and user-generated multimedia content, in addition to the traditional linear and on-demand offerings. As well, the new television is social, allowing exchange of ratings and comments between viewers.

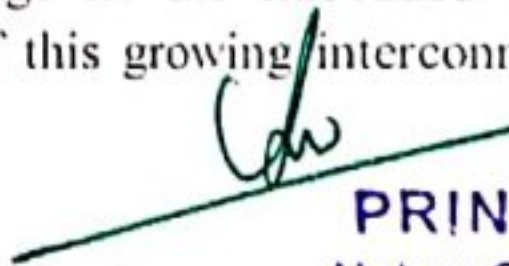
A smart TV may also be referred to as a "connected TV". Essentially, it's a TV that's connected to the Internet. It has built-in apps to take advantage of this - for example, a smart TV would likely have apps for playing videos from Netflix and YouTube. Smart TVs generally also have other built-in apps such as a web browser, Facebook, Angry Birds, and so on. The original concept of Smart TV was started to add functions like Internet and Web 2.0 Specification to legacy TV and it

was believed that it would take the role of PC. Based on the fundamental Smart TV concept, legacy Smart TV system architecture consists of the server providing contents and applications, set-top box clients for home appliances, and reasonable network devices with Internet connection.

Even though it had been improved its system and functions continuously, the independent Smart TV system was requested to upgrade its overall. The system can process contents of only video and image which are already pre-defined or set as a standard. Legacy Smart TV platform was usually designed on a closed private environment and needed customization for each company. It was hard to add functions and difficult to change its structure. Recently new types of Smart TV approaches were introduced by renowned IT companies like Apple, Google, and Samsung to overcome weakness and restriction of legacy Smart TV system. Those were iTV of Apple, Android TV 2.0 of Google, and Smart HUB of Samsung. According to the advent of these brand new system architectures and infrastructures with cloud computing environment, they anticipated that Smart TV would be a core element of killer contents & applications in IT resources with gradual increase of smart devices. Android OS and iOS smart devices are very common personal devices and also have steadily growing numbers of apps of covering various genres and versatile subjects. Regarding mobile apps, iOS apps were exceeded 700 thousand in 2013 and Android apps were also exceeded 700 thousand at the same time. Each new Smart TV system targeted to be a rich-content Smart TV and to give a strong impact to the industry by providing a lot of apps for customers to feel much more added values compared to that of the legacy Smart TV system of having simple broadcasting capability [1].

The Internet has come a long way over the last 30 years. Old-fashioned IPv4 is giving way to IPv6 so that every device on the Internet can have its own IP address. Machine-to-machine communication is on the rise, enabling devices to exchange and act upon information without a person ever being involved. The scope and scale of the Internet have changed. Industry leaders predict that the number of connected devices will surpass 15 billion nodes by 2015 and reach over 50 billion by 2020. The challenge for the embedded industry is to unlock the value of this growing interconnected web of




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AMFTV (Advanced Multiple Featured Television)

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The main feature of this project is home media center. It can be used as a digital photo album to do a slideshow of photos from USB storage or from an online repository like Dropbox, Picasa and Flickr. The home media center uses Kodi which is a free and open-source media player software developed by the XBMC Foundation, a non-profit technology consortium. Kodi is available for multiple operating systems and hardware platforms, with a software 10-foot user interface for use with televisions and remote controls. It allows users to play and view most videos, music, such as podcasts from the internet, and all common digital media files from local and network storage media. It also have features of an application photo booth it can able to take photos using an USB camera and it




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A SURVEY ON MINING ASSOCIATED PATTERN FROM WIRELESS SENSOR NETWORK

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Abstract— Mining of sensor data for extracting a useful knowledge is a very challenging task. Many of the existing works generate sensor association rules to extract useful knowledge based on the frequency of patterns. Most of the techniques quite often generate huge number of rules, but many of them are fail or non-informative to reflect true correlation among sensor data. To overcome this a new type of behavioral pattern called Associated Sensor Patterns (ASP) is introduced which capture temporal correlation as well as association-like co-occurrences which are linked with such co-occurrences. Moreover old information may lose significance for the current time when data stream flows through. So ASP-tree is further enhanced to sliding window associated sensor pattern tree by adopting sliding observation window and to ensure efficient resource usage window size is made dynamically adaptive. Among the various algorithm compared here it is clear that dynamically adaptive sliding window based ASP algorithm an extension of ASP algorithm gives better performance.

Keywords— *Wireless Sensor Network; sensor data stream; behavioral patterns*

I. INTRODUCTION

Wireless Sensor Networks (WSNs) are successfully used for various application and it is a promising and interesting research area for diverse monitoring and detection application such as area monitoring, health monitoring and military surveillance. WSN consists of a large number of sensor nodes which communicates through wireless media to the central sink node and cooperatively works to monitor the environment. WSN generate a large amount of data streams. Extracting such data stream WSN presents new challenges for data mining techniques. Discovering behavioral pattern that means associated pattern is a highly useful in various applications and can be used to predict the source of future events. It can also be used to reveal a set of temporary correlated sensors. Behavioral pattern is used to identifying missed reading events and better management of resources in a WSN. Association rule mining from data stream is not an easy task. For example, in sensor association rule, there is a 75

percent chance of receiving an event from sensor s_3 in λ unit of time if events from s_1 and s_2 are received. This rule is depend on minimum lower bound for support. High value knowledge can able to extract, when the minimum support threshold is set high and large number of association rules are generated when the minimum support threshold is low.


In response to this problem, a new type of sensor behavioral pattern called associated sensor pattern is introduced which capture not only temporal correlations but also association-like co-occurrences which are linked with such co-occurrences in sensor data. There are many challenges in mining associated sensor pattern the main challenges include, maintaining a downward closure property which is needed to ensure search space reduction and to discover associated sensor pattern an appropriate formulation is needed. A compact tree structure is needed to get better mining performance it can able to capture the data content in one scan over datasets. As the tree structure makes adaptive it can effectively captures the recent information and can make optimal use of memory, for this an appropriate data observation window size need to be determined.

II. RELATED WORK

Azzedine Boukerche et al.[2] uses an The Positional Lexicographic Tree (PLT) is used to store a sensor's event detecting status. Its mining process follows the pattern growth approach. The process is same for all of the sensors presented in the PLT structure. Its mining starts with the sensor having maximum rank by generating the frequent patterns from its PLT in a recursive way. Unlike frequent pattern tree, the partitioning mechanism used in PLT for particular pattern it makes it easy to locate the conditional vectors instead of following the nodes link as in frequent pattern tree. As opposed to FP-tree, in PLT there is no need to maintain an entire structure in main memory. Likewise there are various issues that makes PLT outperforms the FP-tree. The disadvantage of PLT in mining is that it needs an mapping mechanism to transform sensor data to a position vector and also the requirement of two database scans for this kind of tree is not suitable for association rules from WSN data.

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A SURVEY ON MINING ASSOCIATED PATTERN FROM WIRELESS SENSOR NETWORK

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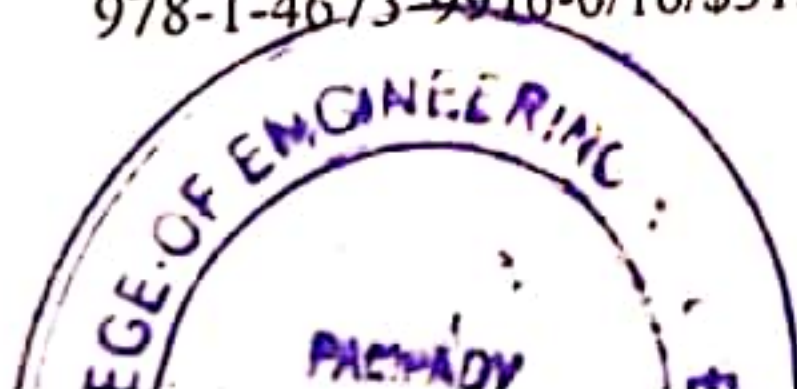
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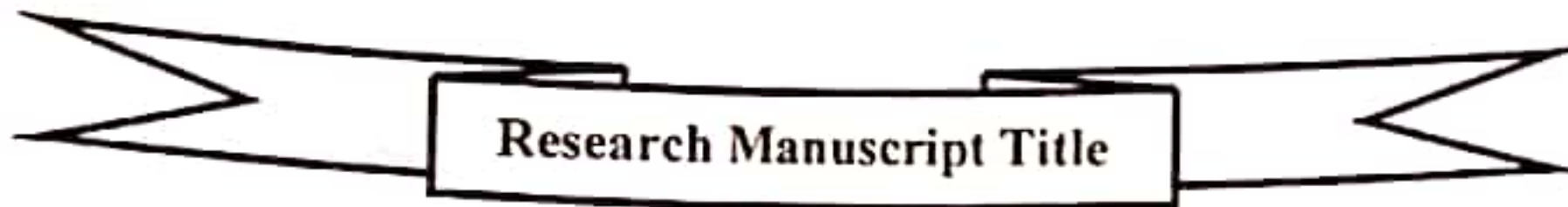
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**PERFORMANCE ANALYSIS OF PUBLIC AUDITING FOR SHARED
DATA WITH EFFICIENT USER REVOCATION IN CLOUD USING
RSA AND AES ALGORITHMS**

Parimala Raghavan, Dr. S. Subasree,

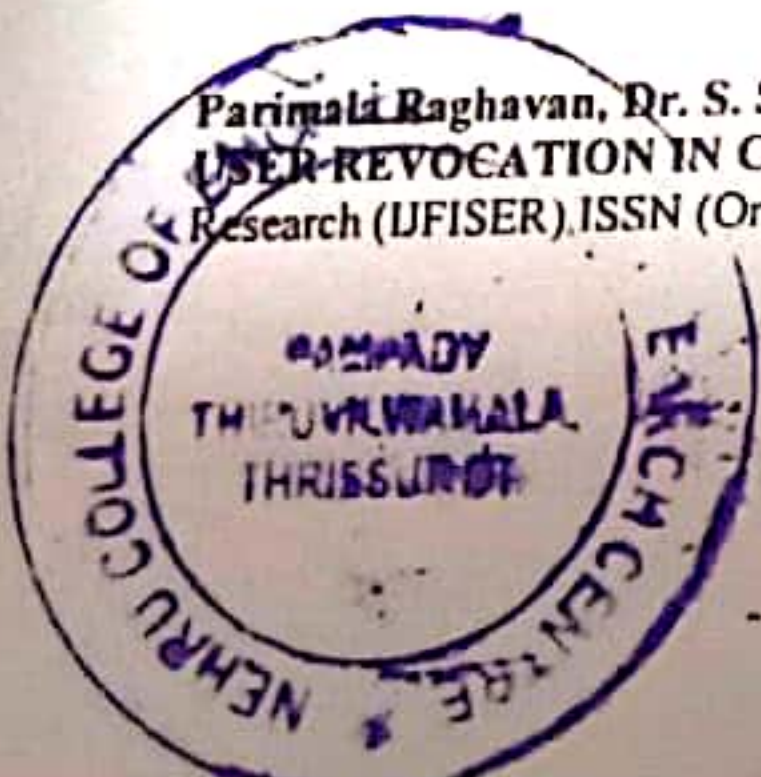
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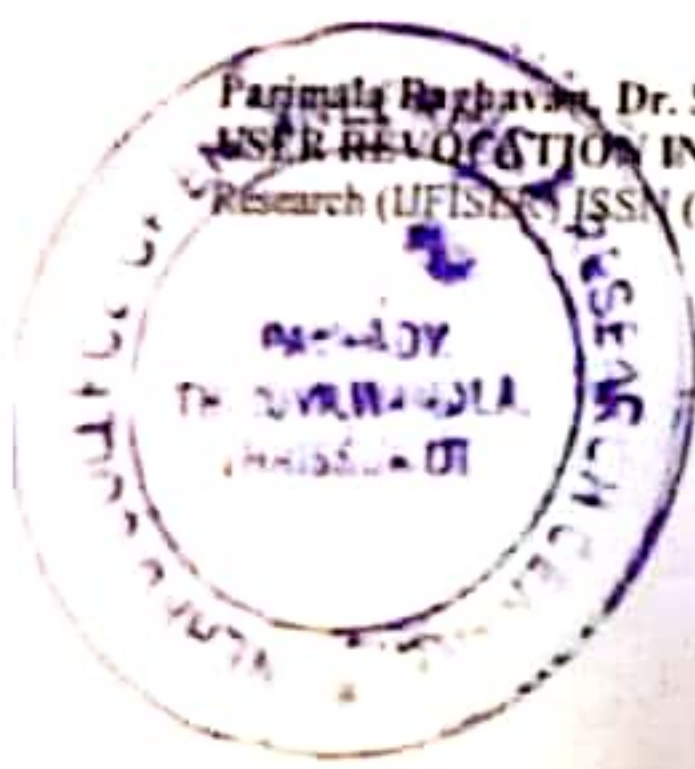
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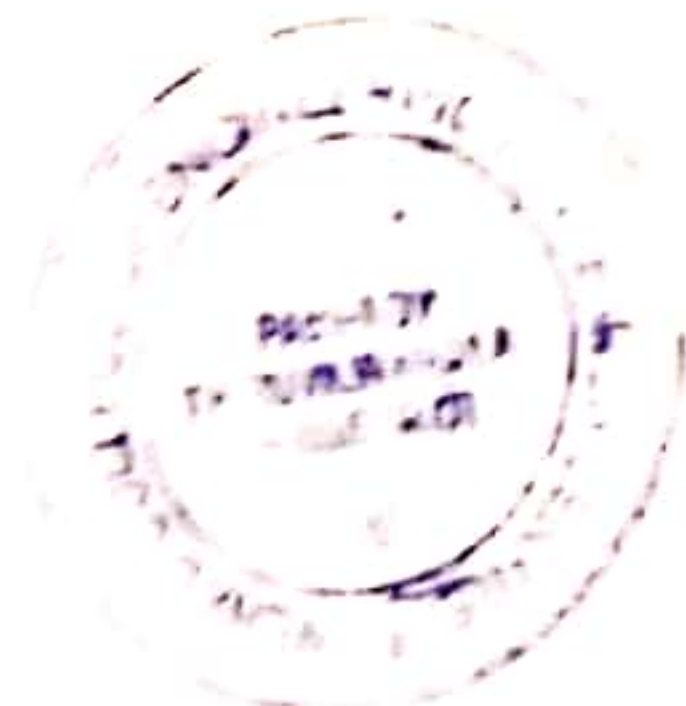
PERFORMANCE ANALYSIS OF DATA MINING TECHNIQUES FOR HIGH
UTILITY PATTERNS DISCOVERY

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Secure and Privacy Preserving Data Analysis of Chameleon Hashing and Service Oriented VANETs

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Abstract –Latest advancements in Vehicular ad-hoc networks (VANET) helps each vehicle for the communication between vehicle to Road Side Units(RSUs) as well as vehicle to vehicle. Major concern in vehicular ad hoc network is the security and privacy depends on the movement of vehicle. In order to meet these requirements in VANET, it must rely on heavily on node to node communication in a better way. At the same time the real identity has to be secured from the third party. In real time traffic there are many forms of attack that threatens security of vehicular ad hoc networks. This paper analyzes Chameleon hashing based privacy preservation as well as service oriented VANETs ,which defend against different types of privacy and security related attacks in real time. This paper also analyzes different methods used for registration, RSU hand over techniques and encryption methods.

Keywords— Chameleon hashing, privacy preservation, REACT, Road side units (RSUs) security, service oriented vehicular ad hoc networks (VANETs)

I. INTRODUCTION

Numbers of techniques are there in VEHICULAR AD-HOC network which make the comfort and safety of vehicles and for the drivers also. It is encapsulated with vast collection of wireless communication techniques, which are focused by number of researchers in nowadays. Besides normal transmission of data, latest trends and opportunities are there on which the manufacturers and communication industries deploys electronic equipments with latest technology. VANET encloses the communication between different entities such

as RSU, known as which is capable of exchanging information or certain messages between OBU (On Board Unit normally inside vehicles). Other than RSU's and OBU's, a Certificate Authority (CA) which is capable of handover the certificates for the units which are in transmission of messages. VANET communication empowers vehicles in an unprecedented way. V2R enables the vehicle to become itself a source of traffic information. Most of the research work in the symmetric cryptography area was for security in networks. This paper deals with the chameleon hashing scheme using Elliptic curve cryptography with REACT. Fig (1) shows the entities in a vehicular ad-hoc network. Main classification of VANET will be in to three groups such as Vehicles, Road Side Unit and Authorities. Vehicles are capable in transmission of messages depending up on each user's interest. It will also check the data that are received from each vehicle or road side unit and verifies those messages to prove trustworthy of data.

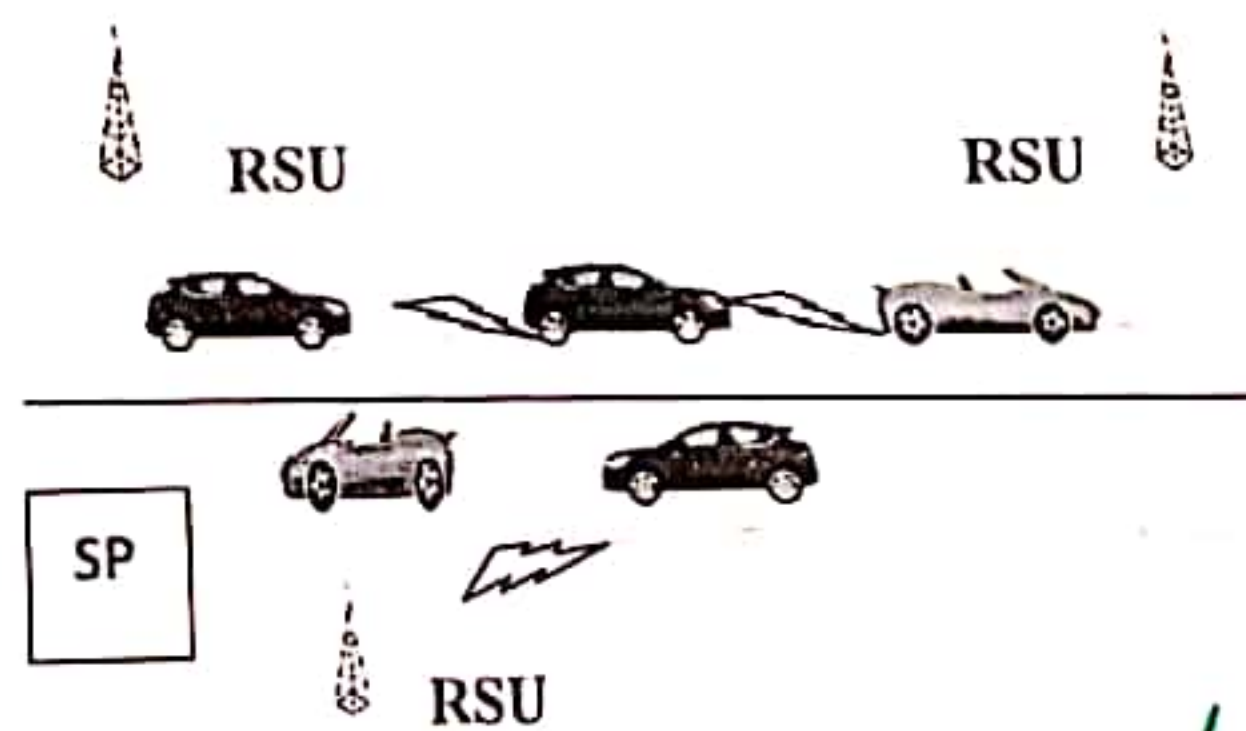


Fig (1) : VANET Architecture

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A Survey of Cardinality Estimation Methods in Crowdsourced Databases

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Abstract—Humans can accomplish many tasks with ease that remains difficult or impractical for computers. As a consequence crowdsourcing was developed which allows programmers to encompass “human computation” as a fundamental unit in algorithms that cannot be fully programmed. Hybrid human/computer database systems make use of crowds for performing tasks such as data gathering which is advantageous to query processing. Such systems raise many implementation questions. Cardinality estimation is a fundamental issue that has been studied for several decades in database community. Accurate cardinality estimation is significant to high-quality query optimization. Various crowdsourcing databases have adopted different methods for cardinality estimation. In this paper, a survey on cardinality estimation methods for crowdsourced database is done.

Keywords— crowdsourcing; cardinality estimation; query execution plan; query optimization

I. INTRODUCTION

In traditional databases, some queries cannot be answered by machines only. Such queries include missing values from databases or different records referring same real world entity. For these types of queries human input is required for query processing.

Crowdsourcing has emerged as an effective way to perform tasks that are easy for humans but remain difficult for computers. Crowdsourcing refers to a Web-based collaboration model where tasks are outsourced to an anonymous work force [3].

In crowdsourcing paradigm; tasks are distributed to networked people to accomplish such that a company's production cost can be greatly lowered. In 2003, Luis von Ahn and his colleagues pioneered the notion of “human computation”, which make use of human abilities to accomplish computation tasks that are complex for computers to process. Later, Jeff Howe coined the term “crowdsourcing” in 2006. [6]

A. Crowdsourcing

To crowdsource a task, its owner, also known as *requester*, submits the task to a crowdsourcing platform. People who can perform the task, known as *workers*, can choose to work on it and devise solutions. Workers then submit these accomplished

tasks to the requester via the crowdsourcing platform. The requester evaluates the posted contributions' quality and might pay workers for their contributions which has been accepted. This payment can be monetary, material, psychological, and so on [7]. Fig. 1. shows the actors in crowdsourcing and their tasks.

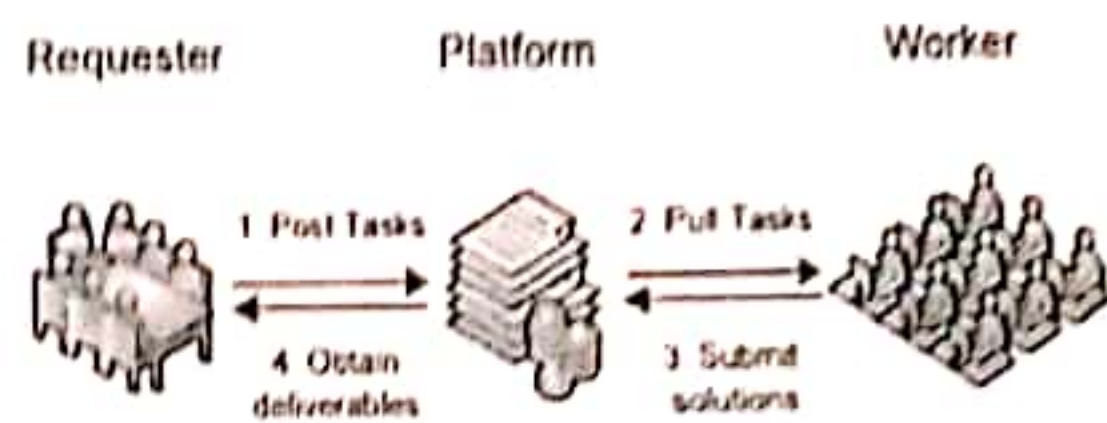


Fig. 1: Actors in crowdsourcing

The crowdsourcing systems such as CrowdDB, Deco, and Qurk are hybrid human/machine systems that target scenarios in which existing micro-task platforms are directly embedded in relational query processing systems.

Cardinality estimates is the calculation of the number of rows in the query result. The query optimizer uses these estimates to select a plan for executing the query. The query performance can be greatly influenced by query plan.

II. RELATED WORK

A. CrowdDB

CrowdDB [2] is a relational query processing system which offers micro task-based crowdsourcing to answer queries that cannot otherwise be answered. CrowdDB takes human input by crowdsourcing to handle queries that can be neither answered by database systems nor search engines. Micro tasks typically do not require any special training and usually take no longer than one minute to accomplish; although in extreme cases, tasks can need up to one hour to finish.



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Secure and Privacy Preserving Data Analysis of Chameleon Hashing and Service Oriented VANETs

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Abstract – Latest advancements in Vehicular ad-hoc networks (VANET) helps each vehicle for the communication between vehicle to Road Side Units (RSUs) as well as vehicle to vehicle. Major concern in vehicular ad hoc network is the security and privacy depends on the movement of vehicle. In order to meet these requirements in VANET, it must rely on heavily on node to node communication in a better way. At the same time the real identity has to be secured from the third party. In real time traffic there are many forms of attack that threatens security of vehicular ad hoc networks. This paper analyzes Chameleon hashing based privacy preservation as well as service oriented VANETs, which defend against different types of privacy and security related attacks in real time. This paper also analyzes different methods used for registration, RSU hand over techniques and encryption methods.

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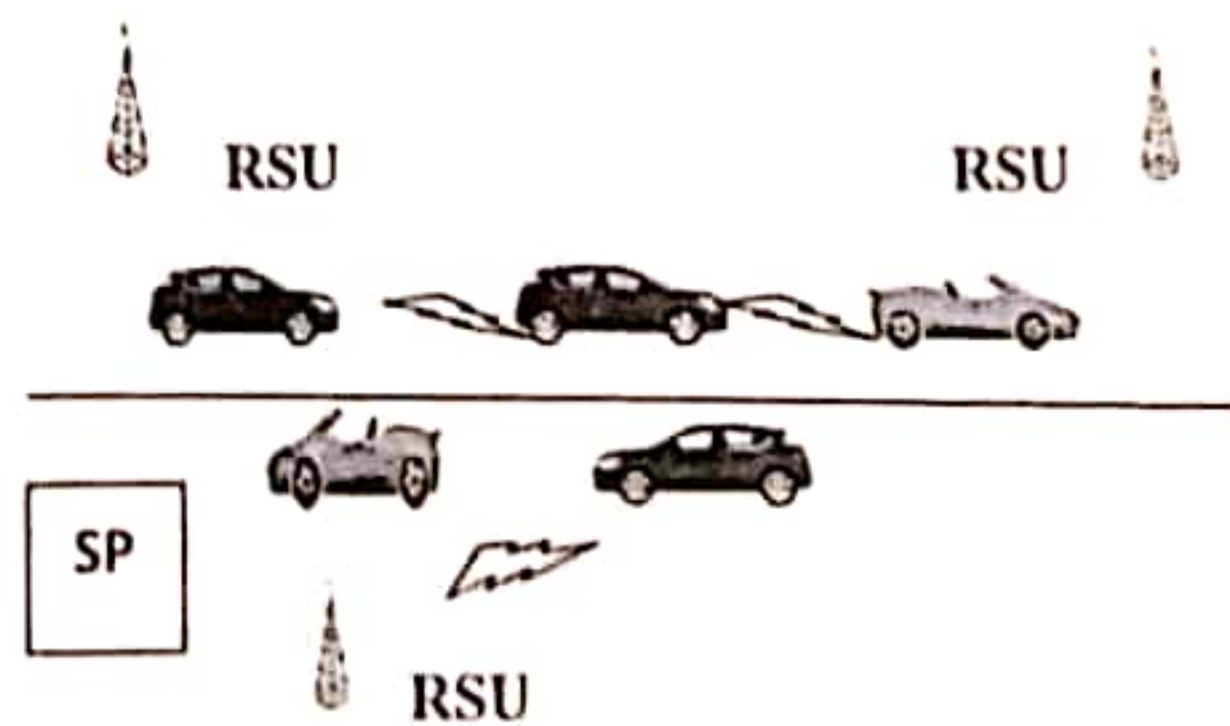


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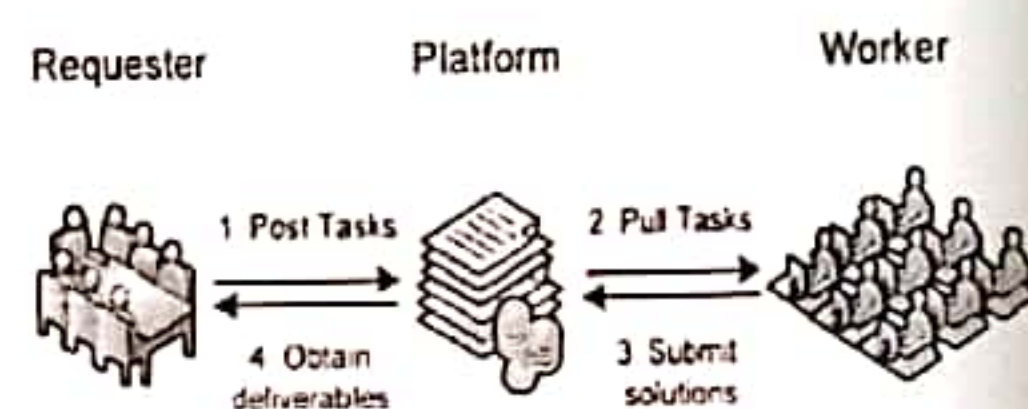


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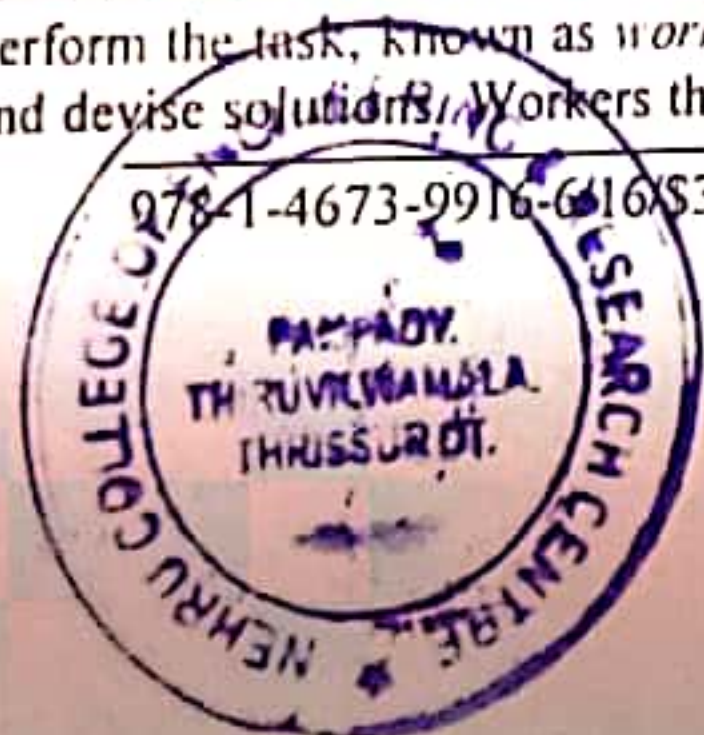
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Comparative study of various Reversible Watermarking techniques for Relational Data

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Abstract—Many real world applications uses open databases which are available in the internet to extract information based on their needs. The relational databases which are freely available are used by research community for mining new information regarding to their research works. These databases are vulnerable to security issues related with ownership and data tampering. The reliability of the data source must be verified before using it for any research or application purpose. In order to ensure ownership and reliability, watermarking is done to the data. When watermark is embedded to the database it reduces the quality of the data thereby making it unfit for information retrieval. In order to avoid this scenario reversible watermarking is deployed which preserves data quality by recovering the original data along with data security. Here are some effective approaches that performs reversible watermarking to ensure ownership along with data recovery. Among the various techniques compared here it is clear that RRW an efficient watermarking technique gives better performance.

Keywords —Reversible watermarking, genetic algorithm, relational data

1. INTRODUCTION

The advancement of information technology has boosted the growth of business and research. In many fields, data are extracted widely from various sources for information retrieval and decision making. Many real world application mine data available in different formats like text, audio, video, images and relational data to gather new idea and information. Especially relational data which is more prominent among the scholar community is shared extensively by the researchers. Open databases are surplus in the internet which helps the scholar to refer different sources. However these databases are viable to many attacks. The data are illegally copied by the attackers thereby posing threat to its ownership rights. There are many cases reported in which personal information of customers are also stolen by the attacker causing major security issue for the data [4]. In order to resolve these issues, and to enforce ownership to data, watermarking technique is being used for many years which effectively denies illegal

copyrighting. The watermark generated will be embedded to the original data which helps to identify the ownership of data. While embedding the watermark to the data the database undergoes certain modification based on the bandwidth of the watermark causing the quality to be compromised. For this, reversible watermarking technique was introduced in which the original data can be decoded from the watermarked data thereby the data quality is kept intact. In reversible watermarking the data owner can specify the distortion tolerance i.e. the amount of change in the data that can be allowed by owner while embedding watermark. In this paper different reversible watermarking approaches such as Differential Expansion Watermarking (DEW), Genetic algorithm based on difference expansion watermarking (GADEW), A robust and reversible watermarking technique for relation data (RRW) are compared in various perspective and the pros and con are analyzed.

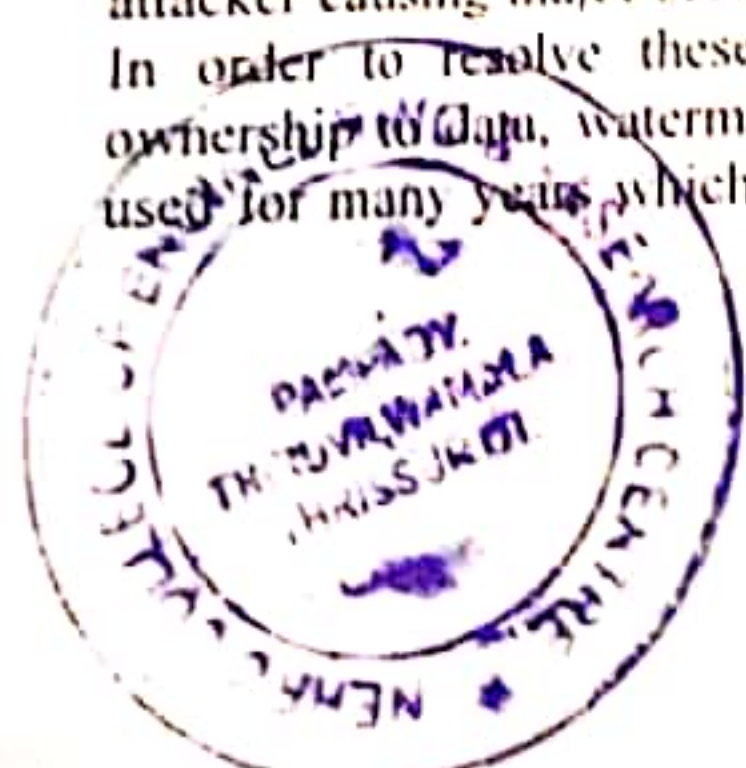
2. REVERSIBLE WATERMARKING TECHNIQUES


These are the different reversible watermarking techniques which use different methods to generate the watermark and are embedded to the original data.

2.1 Difference Expansion Watermarking

Alattar [1], proposed the Difference Expansion Watermarking in which simple reversible mathematical operations on integers are done to embed watermark to the original database. It integrates the watermark bit to the original data in such a way that the original data as well as the watermark bit can be retrieved from the modified data. It selects two values called target value from two different attribute in the relational database in which the watermark is set to be embedded. The average (a) and the difference (d) are then calculated using:

$$a = \left\lfloor \frac{(TV^X + TV^Y)}{2} \right\rfloor \quad (1)$$




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Comparative study of various Reversible Watermarking techniques for Relational Data

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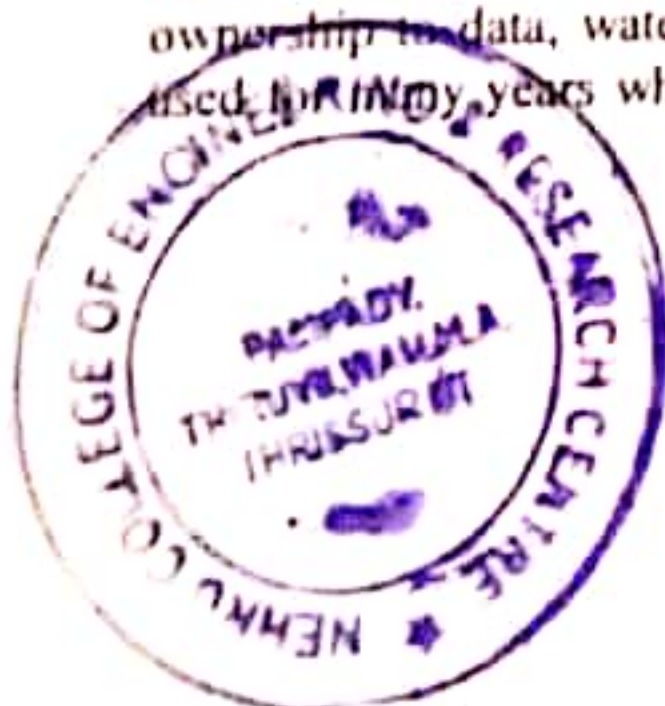
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A SURVEY ON IMPROVING PRIVACY AND SECURITY IN DECENTRALIZED CIPHER TEXT-POLICY ATTRIBUTE-BASED ENCRYPTION

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Abstract— In traditional encryption scheme, user encrypts the data by using a single key which is associated with the user. Cipher Policy Attribute Based Encryption is another encryption technique in which central authority distributes key to the user by using which the data is decrypted under a logical formula. In order to reduce the trust on central authority Privacy Preserving Multi authority Attribute Based Encryption (PPMA-ABE) scheme is introduced. In this scheme, central authority is used only for system initialization. These multiple authorities coordinate with each other and generate the secret keys for the user by knowing his/her attributes. Multiple authorities can identify a user by collecting and analyzing users attribute. Hence the PPMA-ABE scheme is not suitable for protecting the user's privacy. Moreover, there is another efficient public key encryption technique called Cipher Policy ABE (CP-ABE) in which the messages are encrypted by using flexible access structure which is selected by encrypt generator. These techniques are based upon the central authority [1]. Since the trusted authority is a central system which may get crashed or hanged when the overload increases. Therefore it is a challenging task to construct a PPMA-ABE scheme which doesn't use a central authority and the attributes will be hidden from the authorities. These ideas are extended into a technique called Privacy -Preserving Decentralized CP-ABE (PPDCP-ABE). In this paper the trust on the central authority is reduced and user's identity is protected. In this scheme, each and every authority works independently based upon their rules. Furthermore, multiple authorities generate the secret keys for user without knowing the user's attribute.

I. INTRODUCTION

Internet is the most useful technology of modern times which is growing quickly. Most popular use of internet is communication. As the number of internet users increases privacy is getting reduced. In order to provide more privacy cryptography is used. Cryptography is defined as a branch of computer science which is related with data privacy. Encryption and decryption are the two cryptographic methods which are performed on the data during the data transfer and data retrieval.

Traditionally, encryption is a technique in which a sender can encode the data into a target recipient and the receiver can decrypt the data into its original form by using his private key. In some application secret keys are generated based upon the attributes of user. User attributes gives the identity of the user. For example: nationality, name, hair, eye color, sex etc. A predefined finite set is maintained which includes these user attributes which may be binary or discrete numbers [2]. These attributes are privacy sensitive which easily provides the user identity.

Traditional mechanism have some disadvantages such as the sender must obtain the public key of the receiver and it require more storage space because same plain text may be tagged with different public key.

These problems can be improved by Sahai and Waters by proposing the technique which is called as Attribute Based Encryption (ABE) in 2005 [6]. ABE scheme requires a central authority that provides the

secret keys to the user and monitors the universal set of attributes. Sender encrypts the data and attaches it's attribute with the data. The receiver is only able to decrypt the data if and only if there is a match between the attribute which he hold with the cipher text attributes.

Gajal et al had proposed this ABE scheme in key policy form ABE [KP-ABE] which is an extension of ABE [4]. Fine grained access control can be achieved by KP-ABE. Since, in some application the data owner has to trust on key issuer this scheme is unsuitable for such application. KP-ABE is a monotonic access structure. CP-ABE is a no monotonic access structure which is proposed by Bethencourt et al in 2007 [9]. CP-ABE solves the problem of KP-ABE. This CP-ABE scheme is extended further [8], [12], [13]. ABE is categorized into monotonic and no monotonic based upon type of access structure. It is again categorized into key policy or cipher policy based upon access policy. Central authority plays an important role in ABE. In order to reduce the trust on the central authority Multi authority ABE (MA-ABE) scheme is proposed by Chase [14].

In this scheme multiple authorities are used which are maintained by a central authority for system initialization. In this scheme anyone can join as authority and can provide private keys to user. This system doesn't require any central authority for global coordination of authorities.

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Performance Analysis of Data Mining Techniques for High Utility Patterns Discovery

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Abstract. Discovery of High Utility Itemsets(HUI) or pattern from database is very useful in processing business. By defining a tighter upper bound on the utility of candidates more conservative pruning can be achieved. High Utility Pattern growth pruning space by searching a reverse set enumeration tree with utility upper bounding is used in direct discovery of high utility patterns. User can get concise HUIs by using Closed HUI.

Keywords. High utility pattern, closed high utility itemset, utility mining, lossless and concise representation, pattern mining

1. INTRODUCTION

Utility in high utility means importance, interestingness or profitability of the items or pattern whatever the business need. Comprehension will be very difficult for the users if the algorithm gives a large number of high utility patterns. Candidate pattern's Transaction Weighted Utilization (TWU) [2][5][7] is transaction's utility sum.

Simplifying the utility calculation and reducing the number of candidates depends the success of high utility pattern mining. Search space can be better pruned by specifying a tighter upper bound. Pruning search space can be done either Pruning Before Candidate Generation (PBCG) or Pruning After Candidate Generation (PACG).

High Utility Pattern (HUP) [2][9][10] finds itemsets in single phase. TWU patterns are not generating in HUP. Original Utility is represented by using CAUL [2] data structure. High Utility itemsets which have the closed itemset [1] property is closed high utility itemset discovery. It finds less number of itemsets than any other algorithms. If we are considering the number of itemset then CHUD [1][6] is best.

2. RECENTLY PROPOSED HIGH UTILITY ITESET MINING TECHNIQUES

Identified recently proposed techniques as the Direct Discovery of High Utility Patterns [2] and the Closed High Utility Patterns [1] and those are the techniques for mining High utility Itemsets.

2.1 ONE SLOT GENERATION OF HUI

A linear list data structure "Chain of Accurate Utility Lists (CAUL) enables the efficient calculation of utility and estimation of tight utility upper bound. It uses reverse set enumeration tree [2]. There will be an imposed ordering Ω [2] in the tree and root does not contain anything, other nodes are labeled by an item. The path from the node to the root node is the pattern. Child nodes of particular node are the items listed before.

Algorithm 1: Direct Discovery of HighUtilityPattern

```

1 Construct transaction set which contains the
  Pattern and ordering and external utility
2 Reverse set enumeration tree root
3 DFS(node, transaction set of the pattern, minimum
  Utility, given ordering)

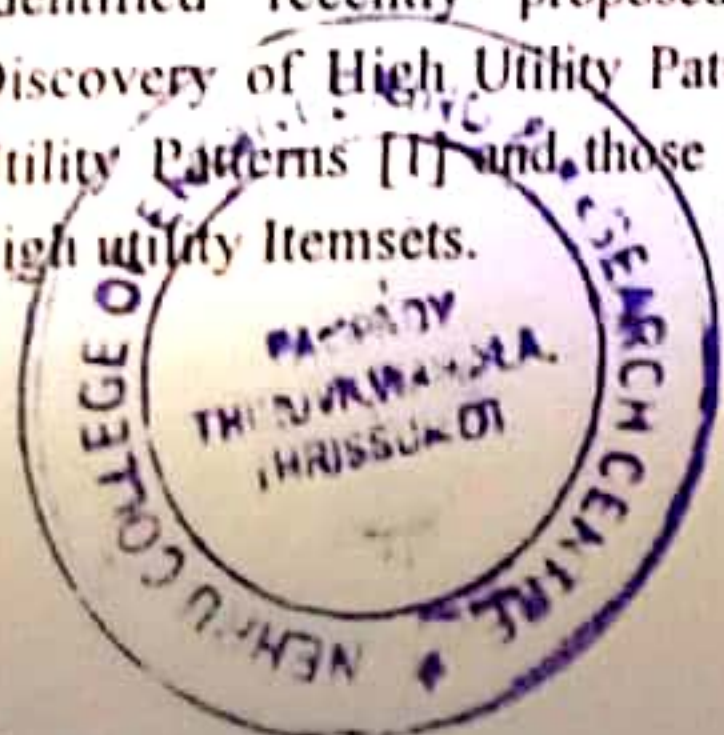
```

Subroutine:DFS(node, transaction set of the pattern, minimum Utility, given ordering)

```

4 if utility of pattern of node  $\geq$  minimum utility then
  output pattern of the node
5  $W \leftarrow \{i | i < \text{pattern of node and utility sum of full prefix}
  \text{ extension of the transactions(union of } \{i\} \text{ and pattern}
  \text{ of node)} \geq \text{minimum utility}$ 
6 if closure (pattern of node, W, minimum utility) is
  Satisfied
7 then output nonempty subsets of WU pattern of node
8 else if singleton(pattern of node, W, minimum utility)
  is satisfied
9 then output WU pattern of node as an HUP
10 else foreach item  $i \in W$  in  $\Omega$  do
11 if basic upper bound  $\geq$  minimum utility
12 then  $C \leftarrow$  the child node of the current node for i
13 transaction set of pattern of node
 $\leftarrow$  project(transaction set of pattern of current node, i)
14 DFS(C, transaction set(pattern of C, minimum
  utility,  $\Omega$ )
15 end foreach

```



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A SURVEY ON IMPROVING PRIVACY AND SECURITY IN DECENTRALIZED CIPHER TEXT-POLICY ATTRIBUTE-BASED ENCRYPTION

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Abstract— In traditional encryption scheme, user encrypts the data by using a single key which is associated with the user. Cipher Policy Attribute Based Encryption is another encryption technique in which central authority distributes key to the user by using which the data is decrypted under a logical formula. In order to reduce the trust on central authority Privacy Preserving Multi authority Attribute Based Encryption (PPMA-ABE) scheme is introduced. In this scheme, central authority is used only for system initialization. These multiple authorities coordinate with each other and generate the secret keys for the user by knowing his/her attributes. Multiple authorities can identify a user by collecting and analyzing users attribute. Hence the PPMA-ABE scheme is not suitable for protecting the user's privacy. Moreover, there is another efficient public key encryption technique called Cipher Policy ABE (CP-ABE) in which the messages are encrypted by using flexible access structure which is selected by encrypt generator. These techniques are based upon the central authority [1]. Since the trusted authority is a central system which may get crashed or hanged when the overload increases. Therefore it is a challenging task to construct a PPMA-ABE scheme which doesn't use a central authority and the attributes will be hidden from the authorities. These ideas are extended into a technique called Privacy -Preserving Decentralized CP-ABE (PPDCP-ABE). In this paper the trust on the central authority is reduced and user's identity is protected. In this scheme, each and every authority works independently based upon their rules. Furthermore, multiple authorities generate the secret keys for user without knowing the user's attribute.

I. INTRODUCTION

Internet is the most useful technology of modern times which is growing quickly. Most popular use of internet is communication. As the number of internet users increases privacy is getting reduced. In order to provide more privacy cryptography is used. Cryptography is defined as a branch of computer science which is related with data privacy. Encryption and decryption are the two cryptographic methods which are performed on the data during the data transfer and data retrieval.

Traditionally, encryption is a technique in which a sender can encode the data into a target recipient and the receiver can decrypt the data into its original form by using his private key. In some application secret keys are generated based upon the attributes of user. User attributes gives the identity of the user. For example: nationality, name, hair, eye color, sex etc. A predefined finite set is maintained which includes these user attributes which may be binary or discrete numbers [2]. These attributes are privacy sensitive which easily provides the user identity. Traditional mechanism have some disadvantages such as the sender must obtain the public key of the receiver and it require more storage space because same plain text may be tagged with different public key.

These problems can be improved by Sahai and Waters by proposing the technique which is called as Attribute Based Encryption (ABE) in 2005 [6]. ABE scheme requires a central authority that provides the

secret keys to the user and monitors the universal set of attributes. Sender encrypts the data and attaches it's attribute with the data. The receiver is only able to decrypt the data if and only if there is a match between the attribute which he hold with the cipher text attributes.

Gajal et al had proposed this ABE scheme in key policy form ABE [KP-ABE] which is an extension of ABE [4]. Fine grained access control can be achieved by KP-ABE. Since, in some application the data owner has to trust on key issuer this scheme is unsuitable for such application. KP-ABE is a monotonic access structure. CP-ABE is a no monotonic access structure which is proposed by Bethencourt et al in 2007 [9]. CP-ABE solves the problem of KP-ABE. This CP-ABE scheme is extended further [8], [12], [13]. ABE is categorized into monotonic and no monotonic based upon type of access structure. It is again categorized into key policy or cipher policy based upon access policy. Central authority plays an important role in ABE. In order to reduce the trust on the central authority Multi authority ABE (MA-ABE) scheme is proposed by Chase [14].

In this scheme multiple authorities are used which are maintained by a central authority for system initialization. In this scheme anyone can join as authority and can provide private keys to user. This system doesn't require any central authority for global coordination of authorities.

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A SURVEY ON MINING ASSOCIATED PATTERN FROM WIRELESS SENSOR NETWORK

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Abstract- Mining of sensor data for extracting a useful knowledge is a very challenging task. Many of the existing works generate sensor association rules to extract useful knowledge based on the frequency of patterns. Most of the techniques quite often generate huge number of rules, but many of them are fail or non-informative to reflect true correlation among sensor data. To overcome this a new type of behavioral pattern called Associated Sensor Patterns (ASP) is introduced which capture temporal correlation as well as association-like co-occurrences which are linked with such co-occurrences. Moreover old information may lose significance for the current time when data stream flows through. So ASP-tree is further enhanced to sliding window associated sensor pattern tree by adopting sliding observation window and to ensure efficient resource usage window size is made dynamically adaptive. Among the various algorithm compared here it is clear that dynamically adaptive sliding window based ASP algorithm an extension of ASP algorithm gives better performance.

Keywords- *Wireless Sensor Network, sensor data stream, behavioral patterns*

I. INTRODUCTION

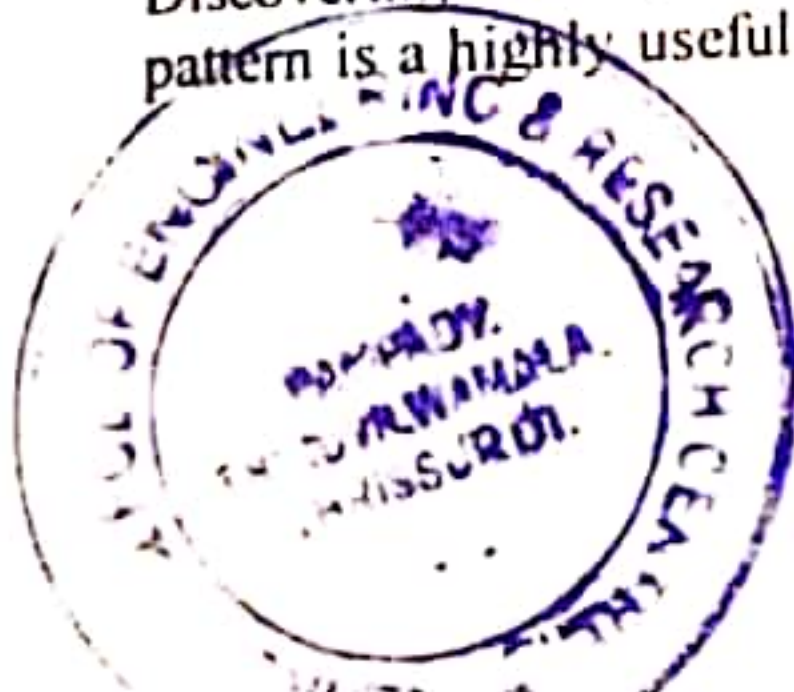
Wireless Sensor Networks (WSNs) are successfully used for various application and it is a promising and interesting research area for diverse monitoring and detection application such as area monitoring, health monitoring and military surveillance. WSN consists of a large number of sensor nodes which communicates through wireless media to the central sink node and cooperatively works to monitor the environment. WSN generate a large amount of data streams. Extracting such data stream WSN presents new challenges for data mining techniques. Discovering behavioral pattern that means associated pattern is a highly useful in various applications and

can be used to predict the source of future events. It can also be used to reveal a set of temporary correlated sensors. Behavioral pattern is used to identifying missed reading events and better management of resources in a WSN. Association rule mining from data stream is not an easy task. For example, in sensor association rule, there is a 75 percent chance of receiving an event from sensor s_3 in λ unit of time if events from s_1 and s_2 are received. This rule is depend on minimum lower bound for support. High value knowledge can able to extract, when the minimum support threshold is set high and large number of association rules are generated when the minimum support threshold is low.

In response to this problem, a new type of sensor behavioral pattern called associated sensor pattern is introduced which capture not only temporal correlations but also association-like co-occurrences which are linked with such co occurrences in sensor data. There are many challenges in mining associated sensor pattern the main challenges include, maintaining a downward closure property which is needed to ensure search space reduction and to discover associated sensor pattern an appropriate formulation is needed. A compact tree structure is needed to get better mining performance it can able to capture the data content in one scan over datasets. As the tree structure makes adaptive it can effectively captures the recent information and can make optimal use of memory, for this an appropriate data observation window size need to be determined.

II. RELATED WORK

Azzedine Boukerche et al.[2] uses an The Positional Lexicographic Tree (PLT) is used to store a sensor's event detecting status. Its mining process follows the



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A Survey on Enhancement in Boosting Efficiency by using Clustered input Dataset.

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Abstract— Supervised learning systems are of great importance in current era. Boosting is an iterative technique for improving the predictive accuracy of such systems. It works by learning multiple functions by considering the output label of previous function as the base of succeeding one. Real world data sets still have issues while dealing with label noise and over fitting of complex functions. To mitigate this issue the datasets are being clustered together using efficient algorithms. The dataset is being grouped together by combining the most similar member data. This clustered data set is then integrated together to the boosting process. Selective boosting is then performed in each of these clusters. Thus it improves predictive accuracy and lessens function over fitting. This survey analyses the variation in predictive accuracy of popular boosting techniques with clustered and non clustered data sets.

Index Terms: clustering algorithms; label noise; supervised learning systems;

I. Introduction

Supervised Learning systems are continuously monitored to ensure the accuracy and efficiency. Therefore accuracy prediction is also an important aspect of Supervised Learning Systems. Boosting is an iterative process capable of improving the predictive accuracy. Subsequent functions in boosting technique solely rely on the values generated by previous functions. Each of these function predicts the succeeding data instances using a weighted vote. A more refined decision boundary on the training data can thus be obtained by combining multiple functions together. This

seems to be more efficient than in cases where only a single function is used.

Even though boosting has a wide range of advantages, it still has limitations. It fall short in the scenarios where the labels of instances provided are wrong in actual sense and in cases where irrelevant features exist in training data set. It also face issues in cases where over fitting of training data occur due to existence of complex functions.

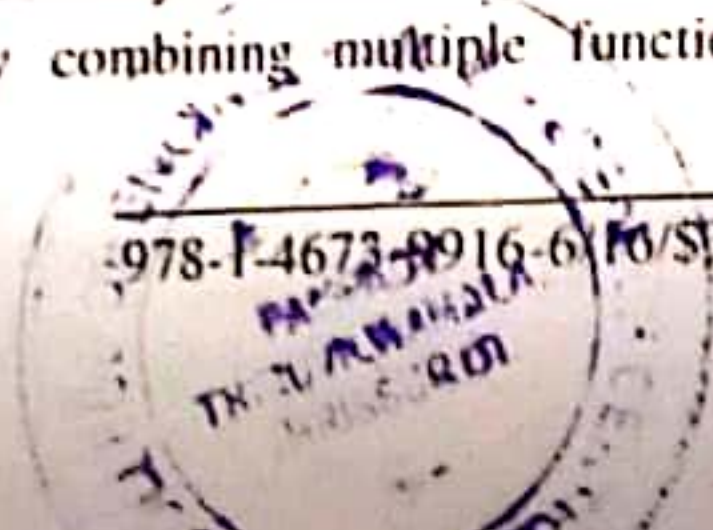
These common issues are mitigated by incorporating clustered dataset as input for boosting. This can augment the way in which boosting learns functions [1]. This paper analyses the variation in predictive accuracy in clustered and non clustered data sets.

II. Related Work

Boosting is done by two different methods: either by resampling and by reweighting. Both these methods exhibit similarity in mode of execution: the probability increases for incorrect instances while it decreases for correct instances.

There are different ways by which boosting and clustering are used together in supervised learning systems. Boosting is used to bump up the efficiency of clustering by predicting the accuracy. Both clustering and boosting can be used together to augment the competence of supervised learning systems and finally clustering can be utilized to perk up boosting technique.

Certain works employ boosting and clustering to improve the splitting points for decision trees[5]. Generally the combination of clustering and boosting together use k-means



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PERFORMANCE ANALYSIS OF PUBLIC AUDITING FOR SHARED DATA WITH EFFICIENT USER REVOCATION IN CLOUD USING RSA AND AES ALGORITHMS

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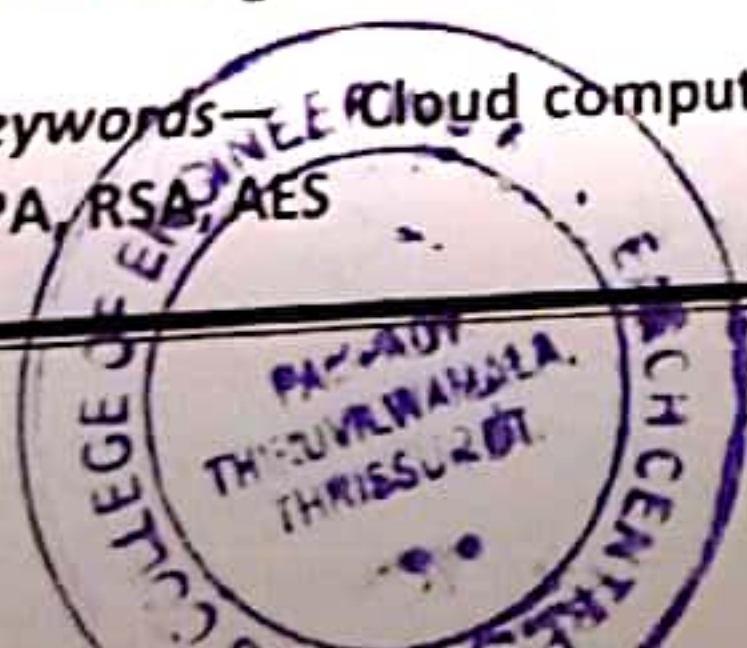
Abstract – Cloud computing is a very familiar term used for the recent development of internet. It is computed in which very large group of remote servers is networked and provide centralized data storage and online access to computer services. Considering Cloud computing, Data security becomes more and more important. When users put their large size of data in the cloud, the data integrity protection is challenging. Encryption is the one of the most important secured ways of preventing unauthorized access. RSA is widely used public-key algorithm, generally it's considered more secure than other encryption algorithms. RSA security is based on integer factorization problem. Small encryption and decryption key were quickly factored and discovered. To overcome this problem we have made use of the AES algorithm because AES requires less encryption and decryption time as well as less space as compared to RSA algorithm. In this paper, we have compared RSA and AES algorithm in terms of uploading time and key size. Based on the comparison results AES algorithm outperforms RSA in terms of uploading them. From the analysis we have identified that AES algorithm is the best and secured algorithm for Cloud Environment.

Keywords – Cloud computing, Public Auditing, TPA, RSA, AES

I. INTRODUCTION

Cloud computing, is a kind of Internet-based computing, where data, information and shared resources are provided with computers and other devices on-demand. It is the new technology that shares computer resources through internet instead of using the software. Cost saving is the main advantage of cloud computing and the prime disadvantage is data security. The data stored in the cloud are accessible to everyone so security is not guaranteed. To ensure data security effective third party auditor is introduced. In the auditing process TPA performs audits for multiple users simultaneously and efficiently. Public verifier efficiently checks the correctness of data without downloading the entire data this is commonly referred to as a public auditing mechanism. TPA will help the data owner to make sure that his data are safe in the cloud and less burdening to the data owner.

Network security has become an important issue. Encryption is the best way to overcome the solution, and plays an important role in information security system. Each encryption methods have advantages and disadvantages. RSA is commonly used Public-Key algorithm, generally it's considered more secure than other encryption algorithms. RSA security based on the integer Factorization



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A Survey of Cardinality Estimation Methods in Crowdsourced Databases

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Abstract—Humans can accomplish many tasks with ease that remains difficult or impractical for computers. Crowdsourcing was introduced which allows programmers to encompass “human computation” as a fundamental unit in algorithms that cannot be fully programmed. Hybrid human/computer database systems make use of humans for performing tasks such as data gathering which is advantageous to query processing. Such systems raise many implementation questions. Cardinality estimation is a fundamental issue that has been studied for several decades in database community. High-quality query optimization demands accurate cardinality estimation. Various crowdsourcing databases have adopted different methods for cardinality estimation. In this paper, a survey on cardinality estimation methods for crowdsourced database is done.

Keywords— crowdsourcing; cardinality estimation; query execution plan; query optimization

I. INTRODUCTION

In traditional databases, some query results cannot be determined by machines only. Such queries include missing values from databases or different records referring same real world entity. For these types of queries human input is required for query processing. Crowdsourcing has emerged as an effective solution to perform tasks that are easy for humans but remain difficult for computers. Human computation makes use of human abilities to accomplish computation tasks that are complex for computers to process. Jeff Howe coined the term “crowdsourcing” in 2006 [6]. Crowdsourcing is a Web based collaboration model in which tasks are outsourced to an anonymous workforce [3].

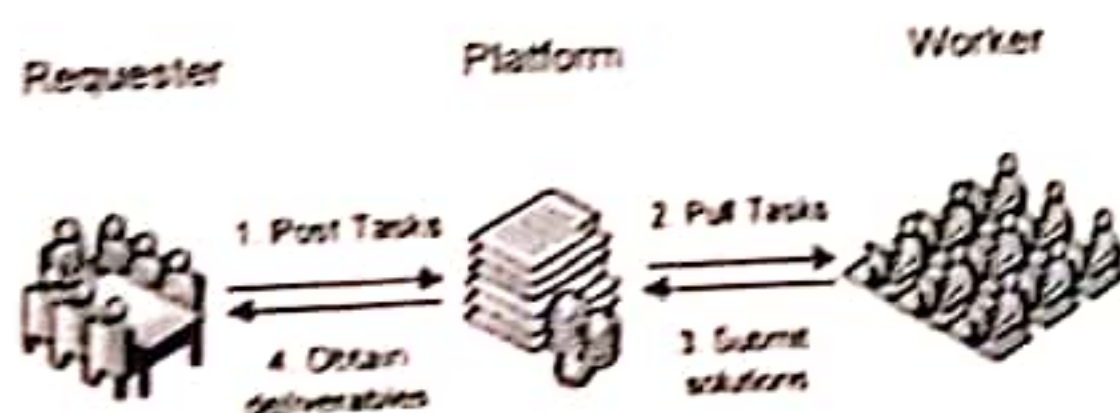


Fig. 1: Actors in crowdsourcing

Fig.1 illustrates a typical crowdsourcing scenario. To crowdsource a task, its owner, also known as requester, submits the task to a crowdsourcing platform. People who can

perform the task, known as workers, can choose to work on it and devise solutions. Workers then submit these accomplished tasks to the requester via the crowdsourcing platform. The requester evaluates the posted contributions' quality and might pay workers for their contributions which has been accepted. This payment can be monetary, material, psychological, and so on [7].

The crowdsourcing systems such as CrowdDB, Deco, and Quik are hybrid human/machine systems that target scenarios in which existing micro-task platforms are directly embedded in relational query processing systems. Estimating the cardinality of crowdsourced databases is major issue. Cardinality estimates is the calculation of the number of rows in the query result. The query optimizer uses these estimates to select a plan for executing the query. The query plan can influence the query performance.

II. RELATED WORK

A. CrowdDB

CrowdDB is a relational query processing system which offers micro task-based crowdsourcing to answer queries that cannot otherwise be answered [2].

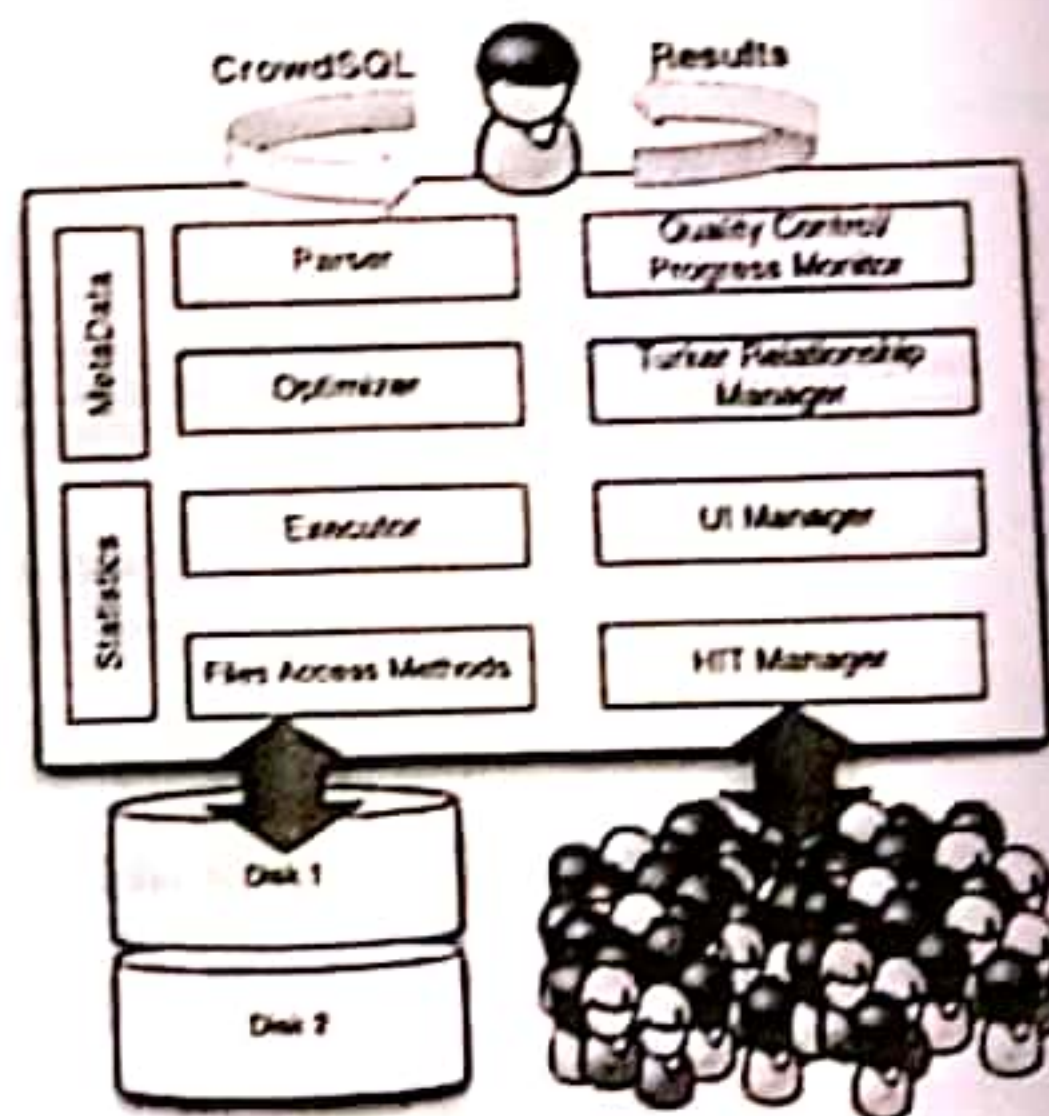
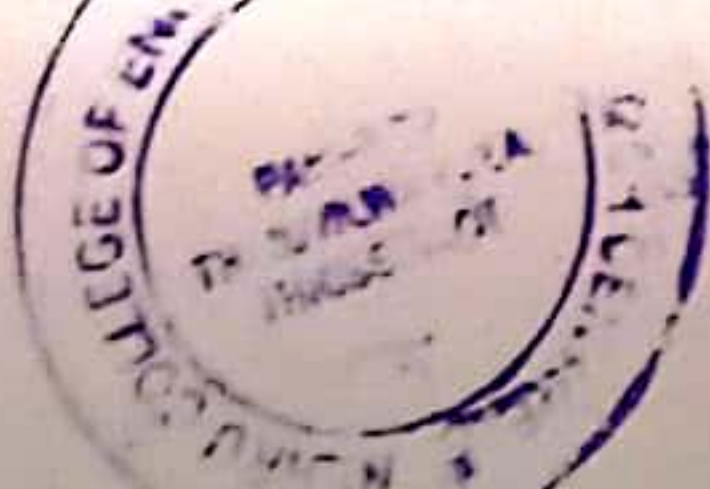


Fig. 2: CrowdDB Architecture



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Comparative study of various Reversible Watermarking techniques for Relational Data

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Abstract—Many real world applications uses open databases which are available in the internet to extract information based on their needs. The relational databases which are freely available are used by research community for mining new information regarding to their research works. These databases are vulnerable to security issues related with ownership and data tampering. The reliability of the data source must be verified before using it for any research or application purpose. In order to ensure ownership and reliability, watermarking is done to the data. When watermark is embedded to the database it reduces the quality of the data thereby making it unfit for information retrieval. In order to avoid this scenario reversible watermarking is deployed which preserves data quality by recovering the original data along with data security. Here are some effective approaches that performs reversible watermarking to ensure ownership along with data recovery. Among the various techniques compared here it is clear that RRW an efficient watermarking technique gives better performance.

Keywords—Reversible watermarking, genetic algorithm, relational data

I. INTRODUCTION

The advancement of information technology has boosted the growth of business and research. In many fields, data are extracted widely from various sources for information retrieval and decision making. Many real world application mine data available in different formats like text, audio, video, images and relational data to gather new idea and information. Especially relational data which is more prominent among the scholar community is shared extensively by the researchers. Open databases are surplus in the internet which helps the scholar to refer different sources. However these databases are viable to many attacks. The data are illegally copied by the attackers thereby posing threat to its ownership rights. There are many cases reported in which personal information of customers are also stolen by the attacker causing major security issue for the data [4]. In order to resolve these issues, and to enforce ownership to data, watermarking technique is being used for many years which effectively denies illegal copyrighting. The watermark generated will be embedded to the original data which helps to identify the ownership of data. While embedding the watermark to the data the database undergoes certain modification based on the bandwidth of the watermark causing the quality to be compromised. For this,

reversible watermarking technique was introduced in which the original data can be decoded from the watermarked data thereby the data quality is kept intact. In reversible watermarking the data owner can specify the distortion tolerance i.e. the amount of change in the data that can be allowed by owner while embedding watermark. In this paper different reversible watermarking approaches such as Differential Expansion Watermarking (DEW), Genetic algorithm based on difference expansion watermarking (GADEW). A robust and reversible watermarking technique for relation data (RRW) are compared in various perspective and the pros and con are analyzed.

II. REVERSIBLE WATERMARKING TECHNIQUES

These are the different reversible watermarking techniques which use different methods to generate the watermark and are embedded to the original data.

A. Difference Expansion Watermarking

Alattar [1], proposed the Difference Expansion Watermarking in which simple reversible mathematical operations on integers are done to embed watermark to the original database. It integrates the watermark bit to the original data in such a way that the original data as well as the watermark bit can be retrieved from the modified data. It selects two values called target value from two different attribute in the relational database in which the watermark is set to be embedded. The average (a) and the difference (d) are then calculated using:

$$a = \left\lfloor \frac{(TV^X + TV^Y)}{2} \right\rfloor \quad (1)$$

$$d = TV^X - TV^Y \quad (2)$$

The difference d is converted to d' by embedding the watermark bit (b) which represents either 0 or 1. The d' is computed using:

$$d' = 2 * d + b \quad (3)$$

Using the average (a) and the difference (d') computed from equation (1) and (3), the modified value for the selected attribute is computed using:

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2015 International Conference on Recent Trends in Computing (ICRTC 2015)

Performance Analysis of Efficient Energy Routing Protocols in MANET

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Abstract

The rapid evolution in the field of mobile computing is driving a new alternative way in which mobile devices form a self-creating, self-administering and self-organizing wireless networks called Mobile Ad hoc Networks (MANETs). In MANET, the aware of power heterogeneity is an important technical challenging problem to increase the energy efficiency of each node. The mobile nodes in MANETs have different transmission power and power heterogeneity. This paper analyzes the performance evaluation of three Efficient Energy Routing Protocols such as EPAR (Efficient Power Aware Routing Protocol), MTPR (Minimum total Transmission Power Routing) and DSR (Dynamic Source Routing). The Efficient Power Aware Routing protocol (EPAR) mainly considers the node capacity by its remaining battery power and the expected energy spent for forwarding data packets reliably. EPAR uses mini-max formulation method for the selection of the route that has maximum packet delivery ratio at the smallest Residual Battery Power. With different network scenarios, EPAR is dominating in terms of Residual Battery Power, Power Consumption, Network lifetime and Throughput with respect to time and routed data packets.

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Keywords: EPAR, MTPR, DSR, Residual Battery Power, Network Lifetime, Power Consumption

1. Introduction

Wireless network is one of the types of data communication network that utilizes wireless connections for connecting devices for exchanging information. Wireless network technology avoids the expensive method of the installations of cables for the data connection between devices within various locations. Radio networks and Wi-Fi local networks are two of the examples of wireless networks. There exists two main classification of wireless networks, infrastructure and infrastructure less wireless networks. In the former, the data communications are created and maintained through access points or routers. An example of this type of network is cellular networks. The latter type is basically known as Ad hoc networks. In such a network where stations are capable of created by themselves and exchanging information between them in a multi-hop style



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Secure Joint Resources Using Quaternion and Complex Fractions for Secure Transmission

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Abstract – The Internet is a collection of shared resources. The present Internet architecture has limited support for both securing and identifying shared Internet resources. As a result, resource exhaustion does occur due to inefficiently sealing systems, selfish resource consumption and malicious attack. In this context, cryptography can be used to provide confidentiality using encryption methods and can also provide data integrity, authentication and non repudiation. The purpose of this paper is to deploy number systems based cryptography schemes for secure sharing of Internet and Intranet resources without global protocol redeployment or architectural support. Quaternion, Farey fractions are used to achieve rotations/orientations in three dimensions. The use of Quaternion Farey fractions is preferred in this work, since, they have the proven advantage that combining many quaternion transformations is more numerically stable than combining many matrix transformations. The objective of this research work is to analyze and implement highly secure cryptography scheme using the properties of quaternion Farey fractions. Encryption and Decryption technique using quaternion and farey fractions can be used for secure transmission over networks that are vulnerable to attacks. The farey fractions can be used to generate the primary key and same is used by quaternion. The process of converting a plain text to a cipher text is called is called enciphering or encryption and the reverse process is called deciphering or decryption.

Keywords: Number Theory, Quaternion, Farey Fractions, Cryptography

I. INTRODUCTION

Rapid growth of electronic communication leads to the issues like information security. Message exchanged worldwide are publicly available through the computer networks which must be confidential and protected against malicious users. Information systems used for e-commerce, e-governance, etc. need to be secured against data loss, unauthorized use, disclosure, or modification. Information has become a strategic resource vital to national security. Attacks against information systems are attractive to unlawful and anti-national elements due to the potential for large mischief using modest resources. This chapter gives the motivation which triggered to secure the secrets from the malicious users, the concepts of cryptography and the organizations of various chapters for achieving the same.

Cryptography is the study of message secrecy. In modern times, it has become a branch of information theory, as the mathematical study of information and especially its transmission from place to place. The noted cryptographer Ron Rivest has observed that "cryptography is about communication in the presence of adversaries", which neatly captures one of its unique aspects as a branch of engineering, and differences from, for instance, pure mathematics. It is a central part of several fields: information security and related issues, particularly, authentication, and access control. Cryptography is also used in many applications encountered in everyday life, examples include security of ATM cards, computer passwords, and electronic commerce, all depend on cryptography.

Encryption and Decryption technique using quaternion and farey fractions can be used for secure transmission over networks that are vulnerable to attacks. The farey fractions can be used to generate the primary key and same is used by quaternion to generate four dimensional encryption keys which significantly eliminates the risk of eavesdropping.

II. MOTIVATION

Cryptography is the study of message secrecy. In modern times, it has become a branch of information theory, as the mathematical study of information and especially its transmission from place to place. The noted cryptographer Ron Rivest [2] has observed that "cryptography is about communication in the presence of adversaries", which neatly captures one of its unique aspects as a branch of engineering, and differences from, for instance, pure mathematics. It is a central part of several fields: information security and related issues, particularly, authentication, and access control. One of cryptography's primary purposes is hiding the meaning of messages, but not usually their existence. Cryptography also contributes to computer science, particularly in the techniques used in computer and network security for such things as access control and information confidentiality.



A Novel Multilevel Inverter Employing Additive and Subtractive Topology

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Abstract

As the demand for high voltage, high power inverters are increasing and there is a problem of connecting a power semiconductor switch directly to a high voltage network. As a part of this the multilevel inverters had been introduced. As a part of this, several researches had been done for the development of multilevel inverters. The commercially available and extensively studied topologies for multilevel voltage output are Neutral Point Clamped (NPC), Cascaded Half Bridge (CHB) and Flying Capacitor (FC) converters. However, with these existing topologies, there is a significant increase in the number of power switches and passive components. Thus it leads to more complex control circuitry and overall cost of the system increase with increase in the output levels. In this paper, a novel multilevel inverter is proposed in which it employs additive and subtractive topology to get higher output levels. This approach significantly reduces the number of power switches needed as compared to existing topology. The present developed multilevel inverter can generate only five voltage levels. With this proposed topology the multilevel inverter can be modified to nine-level inverter. Moreover modified hybrid multicarrier Pulse Width Modulation (PWM) technique can be implemented in the proposed multilevel inverter in order to obtain uniform switch utilization and lower THD. An appropriate modulation scheme is presented and also the proposed concept is analyzed through simulation studies.

Keywords

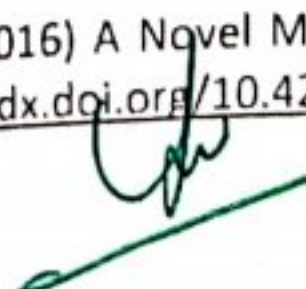
Multilevel Inverter (MLI), Pulse Width Modulation (PWM), Multicarrier PWM Scheme, Additive and Subtractive Topology, Total Harmonic Distortion (THD)

1. Introduction

In the recent technologies, multilevel voltage source inverters have emerged as a viable solution for the conversion

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Experimental study on the effects of camphor ethanol petrol blends in a spark ignition engine: performance and emissions analysis

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Abstract- This paper discusses a detailed study on the performance of a SI engine fuelled with camphor-ethanol-petrol blends. In this study, a mixture consists of camphor and ethanol in weight percentage (20:80) was blended with petrol in three different ratios: 10%, 20% and 30%. A performance test was conducted in the an SI engine at constant speed with varying torque using an eddy current dynamometer in order to evaluate the performance between the blended fuel and the sole fuel, such as brake power, specific fuel consumption, brake thermal efficiency and volumetric efficiency, among others. The study also includes viscosity measurements from a redwood viscometer, Calorific value measurements from a bomb calorimeter, density calculations and exhaust emission tests in a four gas analyser for both blended fuels as well as for pure petrol. It is inferred from the study that lesser specific fuel consumption, less emissions due to complete combustion of air fuel mixture and maximum volumetric efficiency were achieved in the blended fuel that results in efficient working of the spark ignition engine with less pollution. The main objective of this study is to increase the performance of SI engines, to reduce the emission rate and minimize the specific fuel consumption with the blended fuel to make the planet greener.

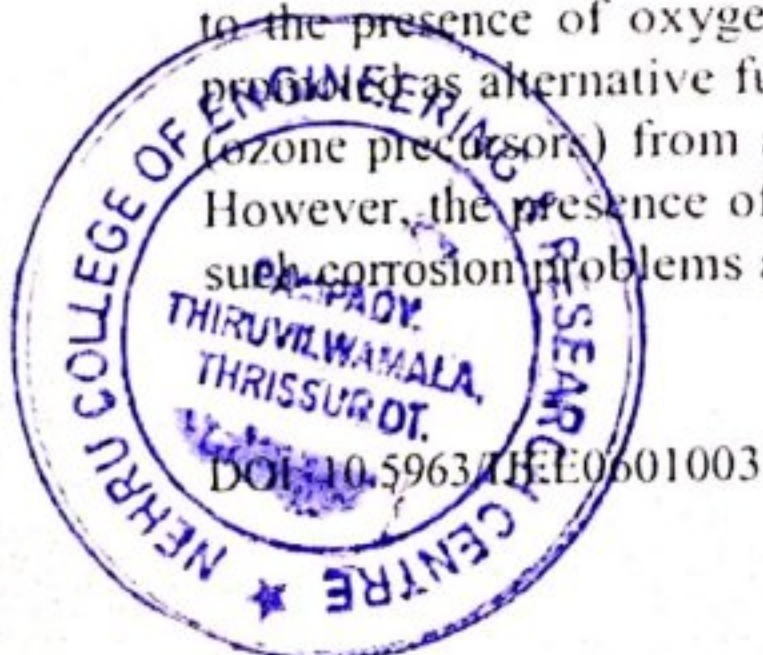
Keywords- Camphor and ethanol mixture; Petrol; Spark ignition engine; Performance test; Exhaust emission test

I. INTRODUCTION

Internal Combustion (IC) engines are the major sources of energy for the automobile sector. These engines consume mainly petroleum products like petrol (gasoline) and diesel as fuels. It has been anticipated that the petroleum reserve will be exhausted soon if some alternative fuels do not replace at least partially petrol and diesel. The alternative fuel should have reasonably good thermal efficiency, low pollution level and should be available for a long time. Over the past decade, environmental concerns have increased significantly in the world. Excessive use of petrol fuel (gasoline) in the SIE (Spark Ignition Engine) shows that it is not environmentally friendly. Petrol leads to global environmental degradation effects such as climate change, the greenhouse effect, acid rain, and especially ozone depletion, among others. Day by day, the large amount of pollutants emitting from the exhaust of the automotive vehicles that run on fossil fuels are increasing, and these pollutants are proportional to the number of vehicles. In the meantime, the demand of energy is ever increasing for industries as well as automobiles. Either a slight modification in the IC engines or adding alcohols such as ethanol and methanol to petrol allows the fuel to combust more completely due to the presence of oxygen, which increases the combustion efficiency and reduces air pollution.

Bridgeman examined the utilization of ethanol-gasoline blends as a motor fuel and found an increase in power and reduction in gaseous pollutant emissions [1]. El-Eman and Desoky conducted a four-cylinder engine study to investigate the effect of using ethanol as an alternative fuel on a spark ignition engine [2].

Abdel-Rahman and Osman used 10%, 20%, 30% and 40% ethanol blended gasoline in a variable compression ratio engine. They reported that the optimum blend rate was found to be 10% ethanol with 90% gasoline [3]. Yüksel and Yüksel made a simple modification of the carburettor system and used 60% ethanol and 40% gasoline blend to test the engine performance and emission characteristics of a four-cylinder SI engine. They reported that the torque output of the engine increased slightly, whereas the CO, CO₂ and HC emissions decreased greatly with the use of ethanol-gasoline blended fuels [4]. The effects of ethanol addition to gasoline on SI engine performance and exhaust emissions were investigated experimentally and theoretically by Bayraktar. He carried out the experimental works with the blends containing ethanol up to 12% by volume. The best result was obtained for 7.5% ethanol experimentally and 16.5% ethanol theoretically without any modification to the engine design [5]. Adding alcohols such as ethanol and methanol to gasoline allows the fuel to combust more completely due to the presence of oxygen, which increases the combustion efficiency and reduces air pollution. Besides, alcohols can be used as alternative fuels in ICE since they do not contain sulphur or complex organic compounds; the organic emissions (ozone precursors) from alcohol combustion have lower reactivity, which can promote ozone formation substantially [6-8]. However, the presence of alcohols in the fuel causes corrosion to metallic fuel system components [9]. In order to diminish such corrosion problems and make the best use of alcohols in the ICE, the engine systems should be redesigned, or low blend



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CFD Analysis of Small Scale Wind Turbine Blade Under Low Reynolds Number

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Abstract - The main aim of this project is to increase the lift force of the wind turbine blade with different airfoil profiles under low Reynolds number. This project describes the aerodynamic performance of wind turbine blade before and after modification of airfoils to increase the coefficient of lift of the horizontal axis wind turbine blade. In this study, a one meter long wind turbine blade suitable for 1.6 KW is designed standard and modified airfoils using SOLIDWORKS software. And Computational Fluid Dynamics analysis had done by using Software version (ANSYS WORKBENCH 16.2) to evaluate the performance between them at 15 m/s wind velocity. The outcome of the analysis study revealed that there was improvement in the coefficient of lift for the wind turbine blade with modification.

I. INTRODUCTION

This project having two correlated goals of designing and CFD analyzing of standard and modified airfoil profiles, the procedure required for modeling of an accurate CAD model for the new blade geometry, and structural integrity verification procedure for the new blade via Computational fluid dynamics under several operating scenarios. The modified rotor blades airfoils were designed to perform at high efficiency at a much lower wind speed and incorporated a CFD verification process which will perform on the both standard and modified rotor blade design. With an increased magnitude of wind energy being captured the aerodynamic force on the rotor blades at the same time increased which necessitated a structural analysis step to be implemented, with the assistance of an adequate CFD program, to ensure the modified rotor blades will not fail under normal or extreme wind conditions. With the completion of this project the new rotor blade designed and analyzed in this report may be finalized and defined throughout this project may be used to design an entirely different aerodynamically modified rotor blade, including a CAD model and CFD structural integrity verification.

II THEORY

A. Airfoil Terminology

A number of parameters are used to describe an airfoil. The mean camber line is the center line between the upper and lower surfaces of the airfoil. The most leading and end points of the mean camber line are the leading and trailing edges. The straight line joining the leading and trailing edges is called chord line of the airfoil, and the distance between leading and trailing edge measured is chord of the airfoil. The maximum distance measured between

the chord line and the mean camber line is called camber, which is measured perpendicular to the chord line. The thickness of airfoil is the distance between the upper and lower surfaces, also measured perpendicular to the chord line. The angle between the wind direction and the chord line is defined as angle of attack α , the geometric terms that have an effect on the aerodynamic performance of an airfoil include: the maximum thickness, leading edge radius, mean camber line, the trailing edge angle and thickness distribution of the profile.

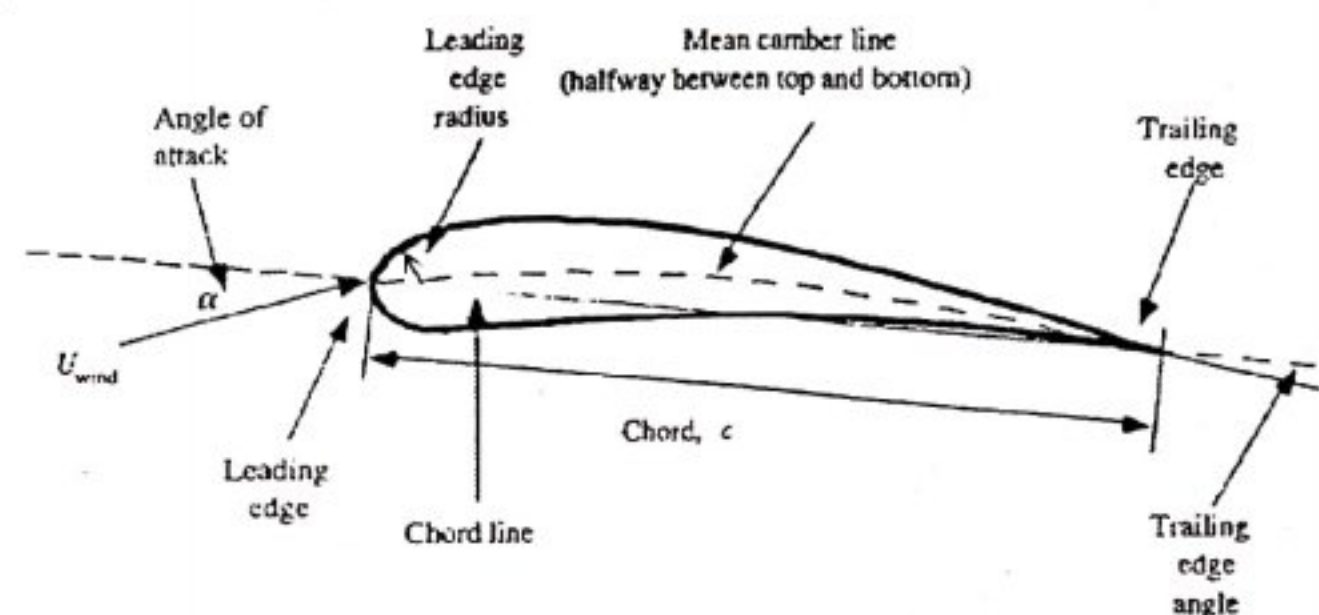


Fig 1: Airfoil terminology

B. Lift force and Drag force

Airflow over an airfoil causes a forces distribution over the airfoil surface. The flow wind velocity increases over the convex surface of airfoil and also lower average pressure on the 'suction' side as compared with the concave or 'pressure' side of the airfoil. In the moment, viscous friction between the air and surface of the airfoil slows the airflow to some extent next to the surface, the resultant of these pressure and friction forces will be resolved into two forces.

- Lift force – force acting perpendicular to direction of the airflow. The lift force is an outcome of the irregular pressure on the lower and upper airfoil surfaces.
- Drag force – force acting parallel to the direction of the airflow. The drag force is due to both viscous friction forces at the surface of the airfoil and to irregular pressure on the upper and lower airfoil surfaces.




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VAPOR ADSORPTION WATER COOLER USING SOLAR THERMAL ENERGY

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Abstract - Heat driven cooling technologies like vapor absorption and adsorption systems are environmentally friendly. Use of thermal compression in these systems saves precious and fast-depleting fossil fuel resources. Solar energy and low-grade waste heat can be effectively used in running these cooling systems. The present work focuses on the development of a solar-powered vapor adsorption based cooling system, which have the potential to be a carbon-free alternative to vapor compression cooling cycles, especially for meeting domestic and office requirements. A test unit of adsorption water cooler has been developed with a dish collector type solar water heater installed on the roof.

Key Words: Adsorption, Solar thermal Energy, Water cooler, renewable, parabolic dish collector, solar irradiance etc.

1. INTRODUCTION

Economic growth of the country is based on consumption of electricity. We are living in a world that faces acute shortage of power to satisfy our daily needs. There is a resurgence of interest on different types of renewable energy technologies including solar thermal energy because of growing environmental concerns and the demand for more enhanced energy security. Refrigerator and water cooler consumes 40% of the electricity among the household articles.

Worldwide, most cooling and refrigeration systems are powered by electricity. Due to the growing cooling and refrigeration demand, peak-load problems in the electricity grid in countries with high cooling load are forever increasing. Thermally driven cooling technologies emerge as promising alternatives and are set to play a key role in the efficient conversion of energy in the field of building air-conditioning and refrigeration. Today, thermally driven cooling technologies are used mainly combined with direct heat source, waste heat, and cogeneration plants. And all these heat sources are conventional fuel based sources. Thermally driven cooling cycles can also operate with solar thermal energy because of the near coincidence of peak cooling loads with the available solar power.

Investigators have examined many aspects of research such as the thermodynamic analysis of the basic cycle, the effect of variations in cooling water temperature, the improvement of mechanical design, the evaluation of performance under conditions of reduced capacity or transient start-up, and the full scale testing. However, in recent years the increasing interest in energy conservation and the efficient use of energy has led to a new methodology and a powerful approach to analyze the solar processes and installations.

1.1 ADSORPTION REFRIGERATION SYSTEM

Adsorption refrigeration technology has been reported to be in use as early as in the 1920s. In the United States, an adsorption chiller powered by the hot gases from burning coal and utilising sulphur-dioxide as refrigerant was used to air-condition railway carriages. The development of adsorption based systems progressed comparably to vapor-compression systems for some years.

However, the development of better and smaller compressors from 1920s and application of synthetic refrigerants like freons during 1930s pushed the development of adsorption systems to the backseat. With the post-depression boom in the economy well underway during this period, refrigerators became a household appliance in the western countries. Due to their compact construction, high efficiency and safe operation, vapor compression technology came to dominate the commercial market and interest in adsorption refrigeration technology declined. After the oil crisis of the 1970s, interest in renewable energy technology resurfaced. Adsorption refrigeration systems were developed with the objective of rational use of energy and were thus powered either by solar energy or by waste heat. As the ecological problems faced by the use of CFCs and HCFCs came to be highlighted during the 1990s, research into new adsorbent-adsorbate pair as well as better methods of heat and mass transfer began in order to improve the efficiency of these systems.

1.2 SOLAR POWERED ADSORPTION REFRIGERATION SYSTEMS

Solar powered adsorption systems make use of solar radiation to effect desorption of the refrigerant from the desiccant pores. Solar energy may be used directly to heat up the adsorbent bed as in the case of some fixed-bed

