



## Dr. T. THIMMAIAH INSTITUTE OF TECHNOLOGY

(Estd. 1986) Oorgaum, Kolar Gold Fields, Karnataka – 563120

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PRINCIPAL

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# An Improved Approach of Unstructured Text Document Classification Using Predetermined Text Model and Probability Technique

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**Abstract.** Document classification is the task to split the document set into distinct highly relative classes or groups based on nature of the document contents. Here, an improved approach of document classification called keyword-based document classification (KBDC) is introduced. It focuses on splitting the unstructured text document set into K number of dissimilar classes based on K predetermined keywords text models by improved probability technique. This new system comprises of the following stages. Namely, pre-processing, classification and classifier stage respectively. Initial, the proposed system (KBDC) recognizes all the immaterial existing contents in the input text document through constructed Predetermined Irrelevant Text Pattern Model (PITPM). Next, it divides the pre-processed document set into 'K' different groups or classes by K number of Pre-determined Keyword Text Pattern Models (PKTPM) through probability technique, where K denotes the number of groups or classes or models. Finally, the KBDC system classifies the trial test text document without any class label that belongs to either of the existing group based on the K different class models (PKTPs). Experimentation results show that the KBDC is appropriate to split and identifies the unstructured text document set into K distinct extremely comparative classes.

**Keywords:** Classification, Classifier, Keyword Based Document Classification (KBDC), Predetermined Irrelevant Text Model, Probability Technique, Predetermined Keyword Text Pattern Model (PKTPM)

## 1 Introduction

Document classification is a procedure that involves the classifying of text documents to their respective set of classes which are predefined with labels [6, 7]. It is a supervised learning approach in which training set of documents  $\{D_1, D_2, \dots, D_n\}$  labeled with classes from  $\{1, \dots, m\}$  are used to construct a model and predict the class label

# A New Technique of digital Certificate Using Blockchain Technology

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**Abstract.** The authorizations granting certification are highly compromised in terms of security details, due to lack of authentication and antiforge mechanism. We adopt block chain technology to overcome the problem of certificate forgery which will confirm users similar to digital signature with his/her identity and accessing authorization. Block chain technology is an open distributed ledger which contains unchallengeable information in a highly protected and encrypted approach and also it ensures that each transactions can by no means be changed. In accord to a high requirement for the method that can pledge to facilitate the information in such a certificate is original, this means that the document has been originated from authoritative resource and is not fake. Interplanetary file system makes use of the content address to exclusively identity every individual file in a overall namespace involving all computing device. A quick response (qr) code is a bi- dimensional barcode which provisions data in the form of black dots and white dots. The system comprises of black squares set in a square framework on a white environment, that can be captured by an imaging mechanism like a camera.

**Keywords:** block chain, hash, digital certificate, interplanetary file system, quick response code.

## 1 Introduction

### 1.1 Blockchain

Block chain was invented by Satoshi Nakamoto in 2008. Block chain facilitate distributed public ledgers which adhere to unchallengeable data in the secure and encrypted method plus guarantee that the transactions can by no means be indistinct. Though Bitcoin and further crypto currencies are the most chic example of blockchain. Distributed ledger technology (DLT) which is a digital system intended for recording the transaction of resources in which the transactions and their information are recorded at different places at the identical time. A block in blockchain is a set of data. The data is further added onto the block in blockchain. The primary block in the

# A Network Intrusion Detection System Using Supervised Learning Techniques

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**Abstract.** With rapid increase in the use of computer network in the fields of industries, education, commerce, social media etc., makes the data security a need of hour. And one of the major threats for data security is the network intrusions, where the attacker intruded the network to steal confidential data's like (passwords, account details, etc.), tries to stop the services or take control of the user devices. In order to stop this intrusion, the Network Intrusion Detection System is proposed (NIDS). The NIDS monitors the network and if any attack occurs, this system detects the attack and will alert the user about respective attack that occurred. Thus, these systems help in preventing intrusions in our networks. And for developing the most accurate NIDS, four different Machine Learning (ML) algorithms are used. The four algorithms used to build a high accuracy system are Random forest, SVM, Naïve Bayes, KNN are used. By identifying the algorithm with highest accuracy, the exact attack can be detected hence the required preventive measures can be taken.

**Keywords:** Anomaly-Based Intrusion, KDD Cup99, Random Forest, SVM, KNN, Naïve Bayes.

## 1 Introduction

A Network Intrusion Detection System (NIDS) is a software that is developed and implemented for network security. This Network Intrusion Detection Systems continuously monitors network traffics and check for all inbound packets and patterns. These systems help us in preventing the attacker (Intruders) who tries to access or manipulating the user data or denying the services of the user. The NIDS Systems continuously monitors the user networks and checks for inbound network packets and data patterns. If any malicious pattern is discovered, the system checks for possible occurrences of attacks in the network and the alert is raised to user about the attacks occurred. The most common categories of intrusions that may occur in the network are dos, probe, r2l and u2r. In order to train the system to detect the above attacks, the KDDCup99 dataset is used. The KDDCup99 dataset contains 41 attributes, this da-



# An Improved Classification Method for Categorizing Larger Online Customer Review into Distinct Cluster for Deep Analysis

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**ABSTRACT:** Online customer reviews are important to choose the products while shopping. Since, Online customer reviews are extensive, flexible and integrated, classifying them based on features can be used by both customers and manufacturers for in-depth analysis. It also eases the burden of opinion mining and recommendation programs. The review analysis is an important issue and a difficult task due to its large volume and unstructured environment. Online customer reviews are collected, pre-processed in advance, informative features are extracted to facilitate clustering. In our paper we present an advanced way to differentiate large online customer reviews using the unsupervised clustering technique process that involves k-means algorithm. This paper is used to find a classification model that separates online customer reviews for optimal use using clustering technique and validate the cluster to determine accuracy of a built-in model

**Highlights:**

Online Customer Reviews, Pre-processing, Feature Extraction, Clustering, K-Mean, Validation

## I. INTRODUCTION

With the rapid development of e-commerce, a large number of product reviews are popping up on the Web. In these reviews, customers can get an initial test of product details and a direct supervision of their purchase actions. In the meantime, manufacturers can get immediate feedback and opportunities to improve the quality of their products in a timely manner. Therefore, mining ideas from online reviews have become an urgent task and are attracting the attention of researchers.

First, however, it is necessary to produce and compile a list of opinion targets and a glossary of words, both of which can provide useful prior knowledge that is useful for review classification. An opinion target is defined as the way in which users express their ideas, usually as nouns or noun phrases. Previous methods often generated an opinion target lists from online product reviews. As a result, opinion targets is often on product


features or attributes. Hence the subtask is also called the product feature extraction. In addition, commentary words are words used to express users' opinions. By the means of the past, the digging of the relationship of ideas between the intentions of ideas and the words of ideas was the key to a collective extraction.

With the rapid growth of knowledge and the rapidly growing number of text and heartwarming emphasizes the need for automated programs to help organize and differentiate customer reviews with a particular aspect of the domain is more important than ever. Monitoring methods of foundation acquisition analysis have yielded good results for the domain they are trained in but having a handwritten data for targeted monitoring procedures for all domains is often costly and time consuming.

We use an unsupervised clustering technique, which can be a K-Means Clustering Algorithm to subtract a certain set of patterns into separate classes. As long as group space can be used to separate patterns into different categories. Review clustering aims to integrate automatically related updates into clusters, it is one of the most important functions in machine learning and artificial intelligence and has received much attention in recent years. The main emphasis is to compile as accurately as possible. Integration review has many important applications in the data mining area and data retrieval. When researching integration, we first divide a data set into groups based on data similarities and then provide group labels. The k-means integration algorithm is used to cluster online customer reviews and to improve quality on a large scale.

## II. PROPOSED SYSTEM

The modules of the system and the relationship between the modules are depicted in the architecture diagram below.

  
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# A Systematic Approach to Enhance the Performance for Stock Market Prediction

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**Abstract** - The stock market is a widely used investment scheme that promises high returns but has some risks. A smart stock forecasting model may be required. Stock market forecast is a way to predict the future value of stock markets based on current and past market data. The use of machine learning technology and artificial intelligence to predict stock prices in a growing trend. We have introduced a two-level reading novel based on the Linear Regression line and the decision-making tree for stock market predictions with an increase in the accuracy of the forecast. We show machine learning model to predict stock value with more accuracy compared to previously used machine learning models.

**Keywords:** Decision tree classifier, forecasting, Lasso Regression, linear Regression, machine learning, stock market, stock forecasting.

## I. INTRODUCTION

The stock market is a public market where traders can sell company shares and obtain an approved stock price. This is called security, which is listed on the stock exchange and the investor is also trading privately. The stock market, also known as the second market, is regulated by a regulatory body called SEBI (Security and Exchange Board of India). An attempt to determine the future value of a stock market is known as a stock market forecast. Stock Forecasting and Analysis is the act of trying to determine the future value of a company's stock or other financial instrument traded on an exchange. The stock market is an important part of the country's economy and plays a key role in the growth of the trading and trade sector that ultimately affects the country's economy.

The stock market is basically a collection of various buyers and sellers of stocks. Stock (also known as general stock) represents the ownership claims in a business by an individual or group of people. The forecast is expected to be strong, accurate and efficient. The system must work according to real-life situations and must be well suited to real-world settings. The

system is also expected to take into account all variables that may affect the value and performance of the stock. There are a variety of ways and means to use the forecasting system such as Fundamental Analysis, Technical Analysis, Machine Learning, Market Evaluation, and Time Composition. With the advent of the digital age, prediction has advanced in the field of technology.

The methods used to predict the stock market include a series of forecasts and technical analysis, modeling of machine learning and various stock market predictions. Stock market data model data includes details such as opening price closing price, details and various other items needed to predict price fluctuations on a given date. The previous model used traditional prediction methods such as multivariate analysis with a prediction series model. Stock market speculation is successful when it is treated as a pressure problem but works best when treated as a divider. The aim is to design a market-based model that uses machine learning strategies and assess future patterns in stock price improvement. The Vector Machine Support Machine (SVM) can be used for splitting and re-pulling. It is considered that SVMs are widely used in a problem-based problem like ours.

## II. PROBLEM IDENTIFICATION

The stock market is huge and difficult to understand. It is considered very unpredictable to predict due to the huge volatility of the market. Stock market predictions are one of the most important issues in the financial market to assist investors when buying or selling shares in a timely manner and affecting the return on investment. Investing in a good stock but at a bad time can have disastrous results, while investing in a stock at the right time can have a positive effect. Today's investors are faced with the problem of trading as they do not fully understand which stocks to buy or which stocks to sell in order to get the best results.

Stock market forecasting is a difficult task since then, the stock market-related data is incomplete and inherent, making it difficult to predict future economic performance. Because we provide signals with a large



# An Improvised Version of Color Image Classification Using Unsupervised Clustering Technique

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**Abstract:** In this day and age, image classification becomes an attractive way to learn multilevel features and data representation. In this work, we propose the concept of image separation k-means algorithm integration. First, we pre-process our images as there are many variations on the front and back of the insert photos. After that we use an unconventional merging strategy known as k-methods for merging our input images. We use the elbow method to find the number of clusters to make k-ons on our database. The aim of our project is to improve the system that separates images and improve the speed of comparison by successfully using the K-means algorithm integration. We also hope that our proposed approach may provide a real-world application that works.

**Keywords:** Image classification, Feature Extraction, Cluster, K-means, Distortion, Elbow Method, Centroids, Datapoints.)

## I. INTRODUCTION

Effective and efficient techniques always contribute to advances in the field of image editing research. Image classification is the process of arranging image objects into a specific number of individual collections or categories of information, based on the features extracted from the image. Researchers have shown great progress in image classification but every algorithm has its limitations and some problems. Feature removal and image separation are two major steps in image sharing. Factors are data that separates each image separately and can be such as size, color, texture, image. Separation process is a process in which we compare image input with training data sets.

People can easily identify and classify any images by their knowledge and experience. However, it was difficult for computers. Image segregation is one of the most common aspects of image processing to perform image classification in a given database. The image size varies and all images are colored. All images have different background and front colors. To solve this problem, we use K-means to integrate algorithms in the pre-image processing process to get a binary image in a

colored image. After obtaining binary images, we apply image separation using the neural and convolution network. We need to combine only two groups (front and back) in this data. Convolution Neural Networks (CNNs) faster than other CNN-trained back-to-back techniques can effectively satisfy image classification tasks with a large number of training images and multiple categories.

Our model is moving to produce high resolution and high results. In order to provide adequate location information, we extract the in-depth focus on the actual images and remove the feature in the images. After the feature is removed, the image classification is performed following the non-viewing combination. We will then use the verification step to check the accuracy of the integration. Each collection is written and stored. Finally we add an image, remove the feature and map it to the saved collections. The results are a unique feature where the image is inserted. The techniques used in our project are shown below the paragraphs.

## II. RELATED WORK

Image classification is a broad area of research in the field of in-depth learning, Curtain Awareness, Human Computer Interaction and attracted many research science. In [9], image classification is performed by removing elements from an image. Usually most of the midlevel class learning methods focus on the coding process or in the Call of Output feature, the image content analysis is done successfully using the royal image creation method. Here each image is shaped into a series of semantic objects such as structure and texture images. The content of a semantic image (text and texture) can be compared to other images using a variety of extraction methods. The next two schemas are used to represent a property-related feature similar to the hand-crafted features used on a single stage network and the second read features from immature pixels automatically over multiple networks.

Next, we discussed the classification of natural images using a biological rehabilitation model. It uses known analogous advances in the visual information system and the process of measuring human brain function. This model is mainly used for image analysis and



# The Design of a Trustworthy Efficient and Secure Election Ballot Voting System

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**Abstract—** India being the largest democracy in the world, elections forms the cornerstone of our country. The right to vote comes under the citizenship act which grants them protection under the 15<sup>th</sup> amendment. To increase the level of security by adding fingerprint sensor so that it will be more fast, secure and convenient. It reduces the number of staff required to conduct voting process there by making it economically efficient. Implementing an automated Secured Voting System and validating the system to ensure that only legible voters are allowed to vote. Check to ensure that the members who are registered are the only ones to vote. No voter can vote twice because the voter finger patterns will be linked to their Aadhar card the proposed system will increase the participation of public in voting. Cloud computing provides mechanism to enhance the security and reliability of votes. Those citizens who have been declared by the law that they are unstable to vote or barred due to corrupt practices or any illegal act relating to elections are not entitled to be a voter.

**Key terms :** Cloud Computing, Fingerprint Module, Security, Voting System.

## I. INTRODUCTION

India being the largest democracy in the world's, election form the cornerstone of our country. As we know that elections are the fundamental defining characteristics of any democracy. The traditional electoral process varies around tallying manually. Now the voting mechanisms have evolved from leaps and bounds of simple handwritten ballots to electronic voting systems. Nowadays it is seen that, many unwanted forces are indulged in bogus voting and recently also been criticized for election irregularities,

that leads to ambiguity between the polling results and the actual verdict given by the people. The current voting mechanism has many security problems, and it is very difficult to prove even simple security aspects about them. This paper provides security and transparency in current voting system.

## II. EXISTING SYSTEM

For the first time in part of Parur Assembly Constituency in Kerala in 1982, on experimental basis. Later, the extensive use of EVMs started in 1998. The EVMs were used at all polling stations in the country in the 14th General Elections to the Loka Sabha in 2004 for the first time. The voter has to cast his vote by once pressing the blue button on the balloting unit against the candidate and symbol of his choice. As soon as the last voter has voted, the Polling Officer in-charge of the Control Unit will press the 'Close' Button. Thereafter, the EVM will not accept any votes. Further, after the close of poll, the Balloting Unit is disconnected from the Control Unit and kept separately. Votes can be recorded only through the Balloting Unit. Again the Presiding officer, at the close of the poll, will hand over to each polling agent present an account of votes recorded. At the time of counting of votes, the total will be tallied with this account and if there is any discrepancy, this will be pointed out by the Counting Agents. During the counting of votes, the results are displayed by pressing the 'Result' button.

## III RELATED WORKS

### 1. Smart voting using fingerprint module and biometric device.

The proposed system is mainly designed for our country. It has three phases. First the details of the persons who are above 18years are extracted from aadhar card database since it had become mandatory in present scenario. Automatically a new voter id with necessary details will be created and intimation will be given to the persons through their e-mail. At the time of voting, the user can specify their id and password. To ensure the finger print minutiae features are different for each human being. finger print is used as a authentication of the voters. As soon as they cast their vote, their voter id and other details will be erased automatically.



# User Verification for Smartphone in Non Intrusive Manner Using Machine Learning Technique

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**ABSTRACT**--Smartphone user verification is important as personal daily activities are increasingly conducted on the phone and sensitive information is constantly logged. The commonly adopted user verification methods are typically active, i.e., they require a user's cooperative input of a security token to gain access permission. Though popular, these methods impose heavy burden to smartphone users to memorize, maintain and input the token at a high frequency. To alleviate this imposition onto the users and to provide additional security, we propose a new nonintrusive and continuous mobile user verification framework that can reduce the frequency required for a user to input security token. Using tailored Hidden Markov Models and sequential likelihood ratio test, our verification is built on low-cost, readily available, anonymized, and multimodal smartphone data without additional effort of data collection and risk privacy leakage.

**Keyword:** Behavioral authentication, user verification, smartphone log, anonymization, sequential probability ratio test.

## I. INTRODUCTION

Smartphones nowadays have become important and ubiquitous sensing and personally assisting devices to support a diverse range of users' daily activities from communication, browsing, social networking, multimedia, online shopping, navigation, task planning to entertainment [1], [2]. People carry their smartphones wherever they go and constantly interact with their devices. The data logged contain both ambience and rich personal activity information, such as mobile payment, access credentials to private accounts, chat history, pictures, and mobility traces, which can be highly sensitive. Access security of a smartphone thus cannot be taken for granted and becomes an increasingly important topic

Smartphone user verification is important as personal daily activities are increasingly conducted on the phone and sensitive information like bank account details,

photos etc is constantly stored in smart phone. In case of theft or attacks, the data from smartphone such as personal data can be used in illegal ways. So protecting the smart phone user on continuous basis is important research study. The developed algorithms can also be used for other secure user interactive systems like ATM, IOT devices.

### 1.2 Existing System

The commonly adopted smartphone access control approach is typically active, where a mobile user actively inputs his/her security token upon request. Access is granted for successful verification of the input-token. Such a token today can be a personal identification number (PIN), a onestroke draw pattern [3], a graphic password [4], [5] or a biometric modality [6], such as a scanned fingerprint, a series of facial images [7] and voice of a predefined passphrase. Despite dominance of the active

authentication methodologies, there is an inherent need to achieve improved tradeoff between security and usability. Here, high security typically translates into complex PINs, draw patterns or long passwords to be defined, memorized and maintained on a regular basis. This imposes significant security burden onto the mobile users, raising usability concern. On the other hand, simple password can be attacked with ease even though it is highly usable. Biometric tokens, though having good usability for identity verification, they are well known to suffer the risk of being stolen and being spoofed [8]. And once stolen, they can be hardly replaced. Also their acquisitions typically require special hardware, e.g. fingerprint scanner, to be embedded into smartphone. Besides the above, it is also worth noting that within the active authentication framework, increasingly a mobile user is asked to enter their security token to unlock their phone or to gain access to sensitive apps. The high frequency of inputting their security token not only imposes significant burden to a mobile user but also increases the risk that one's security token gets eavesdropped in public, smudge attacked or stolen [9] without known.



# A New Approach for Improving MRI Image Pixel Quality Using Unsupervised Concept

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**Abstract-** Machine Learning combined with Image Processing has demonstrated truly life impacting potential in healthcare - particularly in the area of medical diagnosis with its pattern recognition technique. The MRI images shows several anatomical structures of an Organ. But normal MR images are not suitable for fine analysis. When there are any anomalies like tumors, cysts etc., Segmentation, Detection and Extraction of infected area from MR image is of primary concern for physicians. More importantly, it is tedious, time taking task and accuracy depends on their experience only. It is very difficult to have clear vision about structures within organs using simple imaging techniques, Clustering is used for biomedical image segmentation as it uses unsupervised learning. This improves quality of MRI images by identifying desired patterns and partitioning the image into classes with similar intensities(pixel) based on image features. Improving MRI image quality really help the physicians to perform deep investigations and accurate analysis. This also reduces time for Segmentation which is an essential and challenging task to several clinical and research applications as it gives clear visual of image. The clustering approach divides image into many parts which willaid in extracting features and classify as Normal or Tumorous. Improving quality will help in understanding and in study of various anatomical structures.

**Keywords**–Feature Extraction, K-Means, Validation, Unsupervised concept

## I. INTRODUCTION

Image Segmentation is the process of partitioning an image into multiple segments. Image segmentation is typically used to locate objects and boundaries in images.

It is regarded as an integral component in digital image processing which is used for dividing the image into different segments and discrete regions. The outcome of

image segmentation is a group of segments that jointly enclose the whole image or a collection of contours taken out from the image.

Many computer vision tasks require intelligent segmentation of an image, to understand what is in the image and enable easier analysis of each part. Today's image segmentation techniques use models of deep learning for computer vision to understand, at a level unimaginable only a decade ago, exactly which real-world object is represented by each pixel of an image.

Unsupervised segmentation has the advantage of not requiring training data to segment images and therefore is helpful in the absence of a manually-labeled dataset. Unsupervised segmentation methods are more generally applicable and more robust to a typical or unseen situation. In addition, the results of such methods are potential starting points for manual segmentation, thereby expediting the creation of training datasets. Since even an unsupervised segmentation algorithm may be effective in segmenting some but not all classes of images, it is important to explore new methodologies to expand the suitable options for unsupervised segmentation of various classes of medical images.

In medical imaging more specifically, the rise of machine (deep) learning techniques has been similarly impressive to tackle image segmentation, classification, detection, and retrieval tasks, as well as image reconstruction, filtering/denoising, super resolution, etc. In most cases, their performance and efficiency establish them as the new state-of-the-art and the benchmark to beat.

Medical image segmentation, identifying the pixels of organs or lesions from background medical images such as MRI images, is one of the most challenging tasks in medical image analysis that is to deliver critical information about the shapes and volumes of these organs. Many researchers have proposed various automated segmentation systems by applying available technologies.



# Decision making Model for Adaptive Crowd sourcing in Medical Data Platforms by Using Unsupervised Learning

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**ABSTRACT:** The volume of medical data generated by large hospitals is becoming increasingly large due to technological advancements. Oftentimes, medical records are collected and uploaded to the centralized medical records via wireless access points (APs). Wireless Access points gets overloaded due to inefficient queue management, the buffers get overflow and data loss occurs. This research analyses this problem in detail and proposed effective strategies based on machine learning to improve the data management in Crowd sourcing based Medical data platforms. Designing a solution to reduce congestion in the MU and AP for the case of medical data platforms and efficient queue management strategy at MU and AP to reduce the buffer overflow and data loss which can be achieved by designing prioritized scheduling at AP to handle MU with different priorities and optimum energy management solution for MU and AP. The performance of prediction models maybe higher than the performance of random schedulers. Our results may show the power of crowd sourcing for predictive modelling not only in quantity of obtained model, but also in its speed to achieve it. This method of acquiring data works well for large data collection.

**Keywords:** Stochastic decision making; Buffering; Medical data platform ; Crowd sourcing.

## I. INTRODUCTION

In recent years, the volume of medical data generated by large hospitals is becoming increasingly large due to technological advancements in medical devices, including high resolution magnetic resonance imaging (MRI), motion MRI, ultrasound, and digital microscopy. Furthermore, centralized storage of medical records is a common practice for sharing medical data among medical practitioners, as illustrated in Figure 1.



Figure 1: Medical Crowd sourcing

Oftentimes, medical records are collected and uploaded to the centralized medical record using modern mobile equipment, such as smart phones, and via wireless access points (APs). Because of the sensitive nature of medical data, data aggregation, as shown in Figure 1, needs to be privacy preserving.

Therefore, interconnecting medical storage platforms with external networks (such as the Internet) is not recommended. Medical data in the proposed medical storage platform is often gathered and organized by fixed users—e.g., purposed medical tablets, smartphones, computed tomography scanners, etc.—with the principle of crowdsourcing.

As illustrated in Figure1, our reference medical data storage system consists of MUs, APs, an access base station (ABS), and a medical imaging storage unit. The deployed MUs generate various types of data and transmit it to the medical data storage via their associated APs. The medical data storage has a database that stores received medical images. Because of the security and privacy reasons, medical imaging storage should be disconnected from external open networks, such as the Internet, to prevent potential threats. To this end, all stored medical images are obtained only from the deployed MUs. Furthermore, medical storage data are generated and organized in a crowdsourcing-fashion using the various deployed MUs.

Each AP can be associated with multiple MUs and the association decision is made by an AP scheduler. In each AP, the received data from the associated MUs will be forwarded to ABS which is connected to the medical



# An Improved Approach of Automatic Toll Control System

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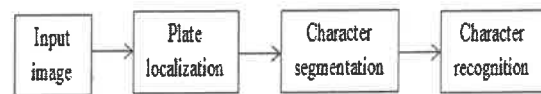
**ABSTRACT:** For the past few eras, the number of vehicles has increased significantly. With this increase, it's becoming grim to keep trail of each vehicle for the purpose of law enforcement and traffic management. Vehicle number plate recognition is employed more and more nowadays for automatic toll collection, maintaining traffic activities and law enforcement. Many systems has been developed for number plate recognition. This paper proposes a novel method for the number plate recognition from vehicles image. It consists of three stages viz, number plate detection, character segmentation and character recognition. The number plate detection/plate localization is the first and probably the most important stage where the position of the number plate is determined. In the character segmentation stage the characters on the number plate are mapped out and segmented into individual characters. In the character recognition stage we wrap up things viz, the characters which were segmented earlier are recognized here. Then the recognized characters are used for the authentication of the vehicle.

**Keywords:** Authentication, Automatic toll collection, Character recognition, Character segmentation, Plate localization, Vehicle number plate recognition.

## 1. INTRODUCTION

Substantial combination of data automation into all features of contemporary existence as created a requirement for handling vehicles as visionary assets in particular systems. Because a discrete system with none data has no perception, there's also a desire to rework information about vehicles between the fact and data systems. This can be executed by human agent, or by special acute apparatus which will be able to recognize vehicles by their number plates in a very real domain and return it into conceptual resources. Due of this, various recognition strategies are developed and number plate recognition systems are today employed in various traffic [4], [12] and security applications, like parking, automatic toll collection[5] and tracking of thievery vehicles[8]. The resolution of this paper is to acknowledge and authenticate the vehicles at the toll plazas with the assistance of their number plates for

automatic toll collection [10]-[11]. Fig 1, manifest the stages of vehicle number plate recognition[2].



**Fig1: Architecture of the Number Plate Recognition System**

## 1. RELATED WORK

A literature review is a momentary swift of previous research. The literature review surveys scholarly articles and other applicable resources to a particular area of research. The work should compute, summarize and tangibly evaluate the previous research. The author Choudhury.A et.al [1], reported Alberta license plate recognition system based on pattern matching, this algorithm can be applied for real time detection of license plates for collecting data, for surveying or for some specific applications. Rupali Kate and Dr. Chitode. J. S [2], presented a number plate localization and recognition system for vehicles in India. This system was developed based on digital images and can be easily applied to commercial car parking systems for the use of documenting access of parking services, secure usage of parking houses and also to prevent car theft issues. Sahar S. Tabrizi and NadireCavus [3], presented a technique for Iranian License plate acknowledgment frameworks which will expand the exactness and lessen the expenses of the acknowledgment period of these frameworks. In such manner, a mixture of the k-Nearest Neighbors calculation and the Multi-Class Support Vector Machines (KNN-SVM) model was produced in the review. PrashantJadhav et.al [4], presented a smart traffic control system using the Mat lab software and it aims to prevent heavy traffic congestion. Prof. NiveditaKadam et.al [5], presented a toll management system which is designed to collect the correct toll value, according to vehicle's class, on arrival of the vehicle at toll booth. Sandipan Chowdhury et.al [6], presented calculations to confine vehicle number plates from regular foundation pictures, to fragment the characters from the restricted number plates and to perceivethe sectioned characters. Tejendra Panchal et.al [7], addresses License Plate limitation with the



## 'A Generative Model- Chatbot Using Deep Learning'

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**Abstract:** The most fundamental communication mechanism for interaction is dialogues involving speech, gesture, semantic and pragmatic knowledge. Various researches on dialogue management have been conducted focusing on standardized model for goal-oriented applications using machine learning and deep learning models. This project designs a dialog based intelligent human interaction. A knowledge repository is available at background and dialog based human interaction system facilities getting information from it in question and answer mode.

The concept of intelligent human interaction is implemented for the managing college admissions. The communication of potential students with a university department is performed manually and it is a very time-consuming procedure. The opportunity to communicate with on a one-to-one basis is highly valued. However, with many hundreds of applications each year, one-to-one conversations are not feasible in most cases. The communication will require a member of academic staff to expend several hours to find suitable answers and contact each student. It would be useful to reduce his costs and time.

The project aims to reduce the burden on the head of admissions, and potentially other users, by developing a convincing chatbot. A suitable algorithm must be devised to search through the set of data and find a potential answer. The program then replies to the user and provides a relevant web link if the user is not satisfied by the answer

**Keywords:** 1.Deep learning; 2. Human like conversation; 3. Natural language processing ; 4. keyword matching

### 1. INTRODUCTION

Digitalisation, the surge of mobile and internet connected devices has revolutionised the way people interact with one another and communicate with businesses. Millennials are accepting and supporting new technology into the routine of their everyday life, this is becoming more is becoming more prevalent as technology companies are streamlining Artificial Intelligence (AI) into the products they offer, such as; Google Assistant, Google Home and Amazon Alexa. The new and upcoming generation are expected to be critical and game changing customers for businesses.

They demand effortless experiences, answers within seconds, not minutes and more intelligent self-service options" (Teller Vision-2017).

The banking and the financial service industry was one of the first industries to adopt technology.

This integration has grown massively, helping banks reach a wider customer base enabling them to perform their banking conveniently.

A chatbot is a software tool that utilises natural language processing (NLP) for human machine interaction (HMI) and Machine Learning (ML). "The complexity of a chatbot is directionally proportional to the scope of the domain". An open domain requires a larger knowledge base, whereas, a closed domain has a more specific knowledge base that was developed to achieve a specific goal.

Chatbot technology initially began in the 1960s to determine whether a chatbot could be portrayed as a human. Throughout the 1980s there was an elevated amount research carried out on natural language interfaces which lead to the development of sophisticated chatbot architectures such as A.L.I.C.E. This chatbot architecture is one of the earlier chatbots developed in 1995 by Dr Wallace which is now opensource, the acronym stands for Artificial Linguistic Internet Computer Entity. This is a chatbot you can create through interaction as it will learn from previous interactions to create its knowledge base. Its knowledge is saved in AIML (Artificial Intelligent Mark-up Language) files which evolved from the Extensible Mark-up Language (XML).

Chatbots are developed using two approaches; a rule-based approach where chatbots operate by moving through branches of a tree diagram of an expert system. The second approach involves advanced artificial intelligence and machine learning, thus the chatbot can learn from the conversations, generating appropriate responses to continuously improve over time.

There are two modes in which chatbots can simulate a conversation with users which include: System-initiated chatbots where- they commence the conversation with





# Autonomous Camera based Eye Controlled Wheelchair system using Raspberry-Pi

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**Abstract**--A novel technique is implemented for the eye controlled based independent and cost effective system. The purpose of Eye movement based control electric wheelchair is to eliminate the necessity of the assistance required for the disabled person. And it provides great opportunity of the disabled to feel of independent accessible life. The implemented system will allow the disabled person to control the wheelchair without the assistance from other persons. In this system controlling of wheelchair carried out based on Eye movements. The camera is mounted in front of the user, to capture the image of any one of the Eye (either left or right) and tracks the position of eye pupil with the use of Image processing techniques. According to the position of the eye, wheelchair motor will be directed to move left, right and forward. In addition to this, for the safety purpose ultrasonic sensor is mounted in front of wheelchair to detect the obstacles and automatically stop the wheelchair movement. To make system cost effective for monitoring, a Raspberry pi board allowed to access the system without displaying unit.

**Keywords:** Image Processing, Open Computer Vision Library, Python, Raspberry Pi, Wheelchair.

## I. INTRODUCTION

The Wheelchair is dependent system used by elderly and physical disable persons. Here introducing the design implementation models of totally independent Eye control electric wheelchair. As per requirement of the disabilities deferent kind of automatic systems are available in market such as voice control or joystick control system. Sometime for totally paralysis person may be have very difficult to use that type of systems. Here the Eye control system provides the independence to make their life easy and more convenient [1]. And also they save the huge amount of energy or external man power. Camera captured the image in real time and analysis the image as input to set the commands for interface the motor driver The motor driver circuit is used to perform the different operation such as left, right, forward and stop.

For the advance level of Image Processing open computer vision (OpenCV) library is used for Face and Eye detection[2]. And several application and algorithms are used to find out accurate pupil location detection and tracking of that. One of them is Haar cascade like features detection to detects single or multiple face and detection of both eye [2]. And several application and algorithms are used to find out accurate pupil location detection and tracking of that. One of them is Haar cascade like features detection algorithm used to detects single or multiple face and detection of both eye [3]. To detecting the exact Eye pupil and locate its center point is ultimate goal of this system. For automatically find out Eye pupil and tracking eye pupil many computer vision library of Image processing are used like object detection, motion detection. For eye pupil tracking there are several number of other techniques available [4] [5].

Moreover, voice activated power wheelchair which works properly, when user speak the command system works according to it like left, right, forward, back, stop. But a noisy environment distracts the system, and system cannot respond properly. And other infrared reflection based eye pupil detection system providing accurate detection of the eye pupil center location, as well as system can track the eye movement. But the infrared radiations affected the eye and user may loss the eye visibility. Therefore, an effective camera captured image based eye pupil detection and tracking system is introduced.

## 1.2 Proposed System

This system is totally autonomous system, and all the module will work independent each other. For the basic requirement of the any electronic system is Power supply. In this system there is mandatory to gives the proper power supply to individual components, and the standard power supply should be used for Raspberry pi, camera, sensor, and motors. The represent the overall functionality of the novel implemented system. The Raspberry pi board is brain of wheelchair. In proposed system model the module like monitor, camera, power



# Polarity Based Sentimental Analysis Technique for Online User Movie Review Using Supervised Scheme

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**Abstract**— Now a days the age of internet has changed the way people express their views and opinions on various platforms like Facebook, Twitter, LinkedIn, Instagram and other internet websites. Sentiment analysis is also termed as opinion mining. Sentiment Analysis aims to determine the polarity of emotions like happiness, sorrow, grief, hatred, anger and affection and opinions from the text, reviews, posts which are available online on these platforms. In this work we conduct sentiment analysis on movie reviews using Machine Learning algorithms Naive Bayes and Logistic Regression. Also we can measure the performance by computing the accuracy of each machine learning techniques and compare two techniques and show the best. This Experimental result shows that the proposed system is well suitable to train the text set and classify the new text command belongs into positive or negative polarity with higher accuracy.

**Keywords**—Sentiment Analysis; Logistic Regression; Machine Learning Algorithms; Movie Reviews; Naive Bayes, Opinion Mining.

## I. INTRODUCTION

Sentiment analysis is the analysis of emotions and opinions from any form of text. Sentiment analysis is also termed as opinion mining. Sentiment analysis of the data is very useful to express the opinion of the mass or group or any individual. This technique is used to find the sentiment of the person with respect to a given source of content. Social media and other online platforms contain a huge amount of the data in the form of tweets, blogs, and updates on the status, posts, etc. In this paper, we have analyzed the Movie reviews using various techniques like Naïve Bayes and Logistic regression.

Also we can measure the performance by computing the accuracy of each machine learning techniques and compare two techniques and show the best.

With the advent of Web 2.0 various platforms like Facebook, Twitter, LinkedIn, Instagram allows citizens to share their comments, views, feelings, judgements on the myriad of topics ranging from education to

entertainment. These platforms contain the huge amount of the data in the form of tweets, blogs, and updates on the status, posts, etc.

Sentiment Analysis aims to determine the polarity of emotions like happiness, sorrow, grief, hatred, anger and affection and opinions from the text, reviews, posts which are available online on these platforms. Opinion Mining finds the sentiment of the text with respect to a given source of content. Sentiment analysis is complicated because of the slang words, misspellings, short forms, repeated characters, use of regional language and new upcoming emoticons. So it is a significant task to identify appropriate sentiment of each word.

Sentiment Analysis is one of the most active research areas and is also widely studied in data mining. Sentiment analysis is applied in almost every business and social domain because opinions are central to most human activities and behaviour.

There are following Phases of Sentiment Analysis:

**Pre-Processing Phase:** The data is first cleaned to reduce noise.

**Feature Extraction:** A token is given to the keywords and this token is now put under analysis.

**Classification Phase:** Based on different algorithms these keywords are put under certain category.

## II. LITERATURE REVIEW

A literature review is an objective, survey of the research work relevant to a topic that are under consideration. Here, is the replication of the literatures presented. Its purpose is to create familiarity with current thinking and research on a particular topic.

**Gurshobit Singh Brar and Ankit Sharma [1]** They used moviethusiast, a movie review in Bahasa Indonesia website as the source of our review documents they collected 1202 reviews and used Naive Bayes classifier method to classify it. Naive Bayes classifier then is used to obtain the highest posterior probability value of the review classes of sentiment.

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# Comparative Study of Feature Extraction Using Different Transform Techniques in Frequency Domain

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# Comparative Study of Feature Extraction Using Different Transform Techniques in Frequency Domain



M. D. Deepak, P. Karthik, S. Sreedhar Kumar, and N. A. Deepak

**Abstract** The compressed sensing is a mathematical approach of reconstructing a signal that is acquired from the dimensionally reduced data coefficients/less number of samples, i.e., less than the Nyquist rate. The data coefficients are high-frequency components and low-frequency components. The high-frequency components are due to the rapid changes in the images (edges) and low-frequency correspond are due to slow varying information (continuous surface). The idea is to retain only low-frequency components, i.e., the significant components that constitute the compressed signal. This compressed signal is the sparse signal which is so helpful during medical scenario. During the Medical Resonance Imaging (MRI) scans, the patient undergoes many kinds difficulties like uncomforness, patients are afraid of the scanning devices, he/she cannot be stable or changing his body positions slightly. Due to all these reasons, there can be a chance of acquiring only the less number of samples during the process of MRI scan. Even though the numbers of samples is less than the Nyquist rate, the reconstruction is possible by using the compressed sensing technique. The work has been carried out in the frequency domain to achieve the sparsity. The comparative study is done on percentage of different levels of sparsity of the signal. This can be verified by using peak signal-to-noise ratio (PSNR), root mean square error (RMSE), and structural similarity (SSIM) methods which are calculated between the reference image and the reconstructed image.

**Keywords** Compressed sensing · Magnetic resonance imaging (MRI) · Nyquist rate · Sparsity

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# Wireless Communication & Tracking System for Underground Mines

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**Abstract**—Underground mining involves miners working in a risky and constrained environment where issues like air quality, temperature, humidity, noxious gases etc. is a matter of great concern. To tackle these, wired tele monitoring systems are widely developed in mines. With the advent of wireless technology, wired data acquisition systems are becoming obsolete and are being replaced by their high-speed wireless counterparts. In this paper, a data acquisition system has been proposed which uses a Ultra-Wideband (UWB) based wireless sensor network to acquire real time data from sensors placed at strategic points in an underground mine. This system works on Received Signal Strength Index (RSSI) Fingerprint Database, which is range free. In this paper, we found that UWB sensors are highly accurate for an indoor & underground positioning system. The applicability of this system can range from just a tracking and communication system to even help in traffic control, assist in rescue operations and even notify personnel inside the mine about blasting or restricted areas.

**Index Terms**— DecaWave DW1000, Internet of Things (IoT), Raspberry Pi, Received Signal Strength Index (RSSI), Underground Safety.

## I. INTRODUCTION

Underground mining involves miners working in a risky and constrained environment where issues like air quality, temperature, humidity, noxious gases etc. is a matter of great concern. To tackle these, wired tele monitoring systems are widely developed in mines. With the advent of wireless technology, wired data acquisition systems are becoming obsolete and are being replaced by their high-speed wireless counterparts. In this paper, a data acquisition system has been proposed which uses an Ultra-Wideband (UWB) based wireless sensor network to acquire real time data from sensors placed at strategic points in an underground mine. This system works on Received Signal Strength Index (RSSI) Fingerprint Database, which is range free. The GPS suspension system is a widely used stand-alone technology, but microwave signals are easily absorbed, displayed by buildings, and held tight, so GPS positioning is not suitable for underground mining. This

paper describes the underground positioning method based on RSSI fingerprint database. The positioning method based on fingerprint database has to go through two stages: the offline fingerprint database establishment and the online positioning. In the offline fingerprint database establishment stage, we need to collect RSSI values of the reference nodes with the known coordinates, to establish the fingerprint database. In the online positioning stage, we compare the real-time RSSI values of the mobile nodes to the fingerprint database's information to calculate the locations of the mobile nodes.

## II. METHODOLOGY

Ultra-Wide-Band sensors are defined as whose full bandwidth is larger than 500 MHz and  $f_c$  larger than 2.5 GHz, or  $B_{frac}$  greater than 0.2 for systems with  $f_c$  less than 2.5 GHz. Although it is a very useful property of UWB that it has a large bandwidth, the width of this large band can interfere with other narrowband systems.

There are two approaches for positioning; direct and two-step. In the direct approach the signal is used for positioning itself. In the two-step approach, positioning is based on parameters extracted from the signal but not the signal itself. The two-step approach imposes less complexity and is close in performance to the direct approach, so the two-step approach is more prevalent in practice and is the focus in this report.

The strength of a received signal is decreased by path loss (PL) which is proportional to the distance between transmitter and receiver. There are two phenomena which affect the amount of PL. The first one is the multi-path phenomenon. Simply, it means that several components of one signal have followed different paths to the receiver, experiencing different amounts of PL. The second phenomenon is shadowing or large-scale fading. The main reason for this phenomenon is a changing environment over long distance propagation.

Parameters used for position estimation:

a) Time of Arrival & Time Difference of Arrival:

Time of Arrival (ToA) gives us information about the distance between the target node and source node for which the position is known. Time Difference of Arrival

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# IoT Based Power Line Communication in Underground Coal Mines

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**Abstract.**The intention of presenting this paper is to transmit/receive digital data via power lines for mining applications. Communications on the Power line use the existing power line network for connectivity purposes. This technology is preferred over other technologies. The advance power line communication network is planned to create "fast data rate and lower cost" connectivity in the remote region. Communication network which needs to cover the entire coal mine is difficult to establish. There's no useful technology currently available to solve this problem. As there are intrinsic benefits of the low-voltage power line in the underground coal mines, we plan to use it for communication. The sensed data of the gases underground is sent to the surface and is displayed in LCD then with help of IoT the result can be accessed throughout the world.

**Keywords:**Power line communication (PLC), sensed gases, internet of things (IoT), high data rate.

## 1 Introduction

Coal was formed some million years ago. Coal was one of the first heat and light sources for humans. The highest reserves are in the U.S., Russia, China and India. The Top 10 Coal Producers in The World are China (3,874), United states of America (906.9), Australia (644.0), India (537.6), Indonesia (458.0), Russia (357.6), South Africa (260.5), Germany (185.8), Poland (137.1), Kazakhstan (108.7).The production of underground coal started with access tunnels, or adits, being mined from their surface outcrops into seams. [1][2] Apart from "air," which consists primarily 78 percent of nitrogen and 21 percent of oxygen, there are four main gasses in a coal mine which concern workers. At underground coal mines, they are carbon dioxide (CO<sub>2</sub>), carbon monoxide (CO), methane (CH<sub>4</sub>), and hydrogen sulfide (H<sub>2</sub>S). In underground mines identification of gasses is necessary. Gas identification and communication network are complicated in underground coal mines. From the times of using humans, birds and safety lamps, we have changed to the usage of gas alarms, gas detection systems, gas sensors and continuous gas monitoring. [3] Common sensors include fuel gas sensors, detectors for photoionization, infrared point sensors, ultrasonic sensors, elec-



# Design and Implementation of Low Power Digital up Counter for digital Beamforming

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**Abstract**— Beamformers have been used for many years in an applications such as Surveillance and RADAR, Communications.

In this project a high speed, reconfigurable DUC module for digital beamforming is designed. The Digital up Converter (DUC) is a digital circuit which implements the conversion of a complex digital base band signal to a real pass band signal.

A DUC consists of a mixer, a direct digital synthesizer and a series of cascaded interpolation finite impulse response (FIR) filter. These filters are designed using MATLAB and developed Verilog code. Simulation is done using Model Sim and functional verification is carried out using Xilinx ISE and, FPGA implementation on Virtex-5 Pro.

**Index Terms**— Beamformers, direct digitally synthesized (DDS), Digital up Converter (DUC), ModelSim,

## INTRODUCTION

Beamforming is used in sensor arrays for directional signal transmission or reception called signal processing technique. The spatial selectivity is achieved by using adaptive or fixed receive/transmit beam patterns.

Digital beamforming (DBF) is a rapidly developing technology which is the most advanced approach to phased array antenna pattern control. When implemented at the array element level, DBF enables full utilization of the maximum number of degrees of freedom in the array. This can lead to significant improvements in beamforming of simultaneous multiple independent beams, adaptive pattern nulling, space-time adaptive processing (STAP), and direction finding (DF), compared to traditional analog array control techniques. Because of its flexibility, DBF may find use in a wide range of phased array antenna applications.

When transmitting, a beamformer controls the phase and relative amplitude of the signal at each transmitter, in order to create a pattern of constructive and destructive interference in the wave front. When receiving,

information from different sensors is combined in such a way that the expected pattern of radiation is preferentially observed. Spatially, this would look like a large dumbbell shaped lobe aimed in the direction of interest. In the wideband systems like SONAR, beamforming technique uses time delay of the signals at the transmitter and at receiver combining those delayed signals to form strong beam. In case of narrowband systems like RADAR, beamforming technique uses phase shift of the signals at the transmitter, so in this case the array of antennas, each one shifts the signal slightly different amount, is called a phased array and combines these phase shifted signals at the receiver constructively to form stronger beam.

Digital beamforming is a technique that requires use of digital up conversion and down conversion that can beam the required signal in the RF range for exploration. The beam forming technique need to be able to drive multiple smart antennas in beaming the signals and collect the required data for imaging. The smart antennas need to generate RF signals with various properties for detection of hidden objects. There are several techniques reported in literature for DUC that can be adopted in digital beamforming.

## DIGITAL UP CONVERTER PRINCIPLE

Digital up-conversion is a well known sample rate conversion processes in Digital Signal Processing. This technique is widely used for converting a baseband signal to band pass signal to enable the transmission and reception. For the baseband signal to be transmitted, it needs to be modulated on to an IF/RF carrier frequency. Nyquist theorem [1] says the sampling rate shall be at least twice the highest frequency component. Hence the base band signal, whose sample rate might be very less compared to IF/RF carrier signal sampling rate, needs to have the sampling rate to match the IF/RF carrier signal sampling rate. It's the reverse process with respect to receivers. In case of receivers the sample reduction helps to reduce the processing complexity of the received baseband signal. In simple, up conversion can be defined as generating new samples by virtue of adding zeroes (also called as Interpolation) and interpolate the new samples. Basic sample rate conversion is explained in the Figure 1.1



## A Disaster Monitoring Technique of: Iceberg Movement Detection using Active Sensor Images

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**Abstract**— Disaster monitoring is an important aspect of global change. This work initiates image based investigation of iceberg movement detection caused by disaster impact due to global warming and tsunami effect. Satellite images are emerged for rapid testing and make aware of continuous monitoring of catastrophe area. Synthetic aperture Radar (SAR) images are utilized for Climate convenience. SAR images are affected by some sort of noise called as speckle. This speckle noise influenced by reflections of electromagnetic features and needed to remove for post processing stages. Pre-processing stage is done with adaptive filter to remove speckle. Then, images from two instances of time is compared and implemented with Gabor based multi-scale algorithm. The different scale responses are summed together. Binary thresholding algorithm is used to classify the before and after iceberg migration. The proposed algorithm is examined by two SAR images are Tohuku and Pine dataset, and also secured accuracy of 97.80% and 97.44% respectively. This algorithm provides excellent iceberg migration accuracy and perfect edges of broken ice.

**Keywords** – SAR image, Speckle noise, Gabor filter and Performance analysis.

### I INTRODUCTION

Iceberg detection in sea ice is significantly more difficult than in open water. An occurrence of iceberg impact on manmade structures poses a substantial hazard to offshore operations. Effective detection and drift prediction as well as ice management techniques such as deflection and towing help mitigate the risk of iceberg impact to offshore structures. Environmental conditions such as daylight, fog, wind speed, wind direction, sea state and existence of sea ice all play major roles in the ability to remotely sense icebergs. This work focuses specifically on one of the most challenging environmental scenarios for the remote sensing of icebergs that is, icebergs detection in sea ice.

There are many options for the detection and tracking of icebergs, such as various cameras, satellite, air borne, ground based radars and optical sensors and underwater sonars. The use of data from optical sensors requires suitable cloud and light conditions. Satellite Synthetic Aperture Radar (SAR) Images are among the preferred data sources for operational ice centers that are responsible for providing information on sea ice conditions and iceberg occurrences.

Synthetic-aperture radar (SAR) is a form of radar that is used to create two- or three-dimensional images of objects, such as landscapes. SAR uses the motion of the radar antenna over a target region to provide finer spatial resolution than conventional beam scanning radars. Electromagnetic radiation in the microwave wavelength region is used in remote sensing to provide useful information about the Earth's atmosphere, land and ocean. A microwave radiometer is a passive device which records the natural microwave emission from the earth. Terrestrial or ground-based SAR Interferometry is a remote sensing technique for the displacement monitoring of slopes, rock scarps, volcanoes, landslides, buildings, infrastructures etc. Synthetic Aperture Radar (SAR) image data provide information different from that of optical sensors operating in the visible and infrared regions of the electromagnetic spectrum.

Synthetic aperture radar (SAR) satellite systems currently in operation include the European Space Agency's (ESA) European Remote Sensing Satellite 1 (ERS-1), launched July 1991, and the Japanese Earth Resources satellite (JERS-1), launched February 1992. Remote sensing instruments are of two primary types—active and passive. The sensor then detects and measures the radiation that is reflected or backscattered from the target. Passive sensors, on the other hand, detect natural energy (radiation) that is emitted or reflected by the object or scene being observed. Remote sensing instruments are of two primary types active and passive. The sensor then detects and measures the radiation that is reflected or backscattered from the target. Passive sensors on the other hand detect natural energy (radiation) that is emitted or reflected by the





# Heart Disease Prediction Using Intelligent Based Machine Learning System

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**Abstract-** Heart disorder is one of the most complicated and life threatening disease, when we talk about detection of diseases related to heart it has to be done very efficiently as it is the basis on which entire treatment process will be decided. This project proposes the systematic process for predicting and diagnosing the cardio vascular disease and few more diseases of heart. In this project work, our concentration is on predicting and diagnosing the heart disorder using SVM, Decision tree and K-means algorithm, which provides various significant attributes in the medical literature. Those attributes are been used in the algorithm along with an dependent variable which can have various values 0 or 1(i.e. test positive or negative).The number of peoples taking up the test will be divided into a required ratio(eg:80:20)out of which 80 will be given for training model and 20 will be given for testing model. The database which will be collected from the medical organization will be compared with the training components and here the patients will be categorized. The classified output will be given to the testing model which will compare this result with the result generated by the dependant variable when these values matches the heart disorders will be predicted with good accuracy.

**Keywords –** Heart disorder, SVM,K-means, Decision tree.

## I INTRODUCTION

Heart disease is a major life threatening disease that can cause either death or a serious long term disability. However, there is a lack of effective tools to get a hidden relationships and trends in a e-health data. Medical diagnosis is a complicated task and plays a vital role in saving human lives so it needs to be executed accurately and efficiently. An appropriate and accurate computer based automated decision support system is required to reduce the cost for achieving clinical tests. This provides an insight into machine learning techniques used in diagnosing various diseases. Various

data mining classifiers have been discussed which has emerged in recent years for efficient and effective disease diagnosis.

The Heart is one of the most important organs in the human body. It is the center of the circulatory system. The heart functions as a pump that propels blood to different parts of the human body through a network of blood vessels, supplying a constant supply of oxygen as well as other vital nutritional components. If the heart ever stops functioning and ceases to pump blood, the body will shut down and within very less time a person will expire. The usage of information technology in health care industry is increasing day by day to aid doctors in decision making activities. It helps doctors and physicians in disease management, medications and discovery of patterns and relationships among diagnosis data. Current approaches to predict cardiovascular risk fail to identify many people who would benefit from preventive treatment, while others receive unnecessary intervention. Machine-learning offers opportunity to improve accuracy by exploiting complex interactions between risk factors. We assessed whether machine-learning can improve cardiovascular risk prediction.

Our study shows that artificial intelligence could significantly help in the fight against it by improving the number of patients accurately identified as being at high risk and allowing for early intervention by doctors to prevent serious events like cardiac arrest and stroke. Based on their results, it is clear that artificial intelligence and machine learning techniques have a key role in fine-tuning risk management strategies for individual patients.

Data Mining techniques available namely Classification techniques involving Naive Bayes (NB), Decision tree (DT), Neural network (NN), Genetic algorithm (GA), Artificial intelligence (AI) and Clustering algorithms like K-NN, and Support vector machine (SVM). Cardiovascular sickness is one of the most important human-threatening and life qualities reducing disease. Heart failure is the first cause of admission by healthcare



# Detection of Micro Aneurysms in Retinal Images using Machine Learning Techniques

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**Abstract**— The discrimination capabilities in the texture of fundus images to differentiate between pathological and healthy images. The goal is to distinguish between diabetic retinopathy (DR), age-related macular degeneration (AMD) and normal fundus images analyzing the texture of the retina background and avoiding a previous lesion segmentation stage. Detection of diabetic retinopathy in early stage is essential to avoid complete blindness. In the system we are using image processing techniques through software support that is Python coding language by usage of ANACONDA tool. The method presenting in this work is a machine learning algorithm for describing retina texture and can be useful in a diagnosis aid system for retinal disease screening. Then the local region ( $64 \times 64$ ) surrounding the candidate points are forwarded to the trained CNN model for classification identification. A pixel-wise accuracy of 96.92%, and specificity of 98.09% is achieved with the proposed CNN architecture on the test database.

**Index Terms**— Diabetic Retinopathy, Retinal Imaging, Deep Learning, Convolutional Neural Networks, Exudate Detection

## I. INTRODUCTION

Diabetic retinopathy (DR) is the leading cause of blindness and vision loss for working age population in developed countries [1], [2]. Early detection and yearly screening is necessary to prevent further vision loss for people with diabetes [1]. Considering the rapidly increasing number of diabetic patients, automatic DR grading has the potential to alleviate the workload of ophthalmologist, improve the efficiency and reduce the cost for DR screening [3]–[5]. Exudate is resulted by the breakdown of the blood-retinal barrier, allowing leakage of serum proteins, lipids, and protein from the vessels [2].

It is one of the preliminary clinical signs of DR. Therefore, the accurate and automatic detection of exudate is crucial for the diagnosis of DR. Exudates are

presented as white or yellow bright structures in color fundus images, with variable shapes and contrast. A typical DR image with exudate is shown on Fig 1. The automatic detection of exudate has been extensively investigated with different techniques proposed. Typically, the detection of exudates can be broadly divided into three steps: getting exudate candidates, extracting features and machine learning.

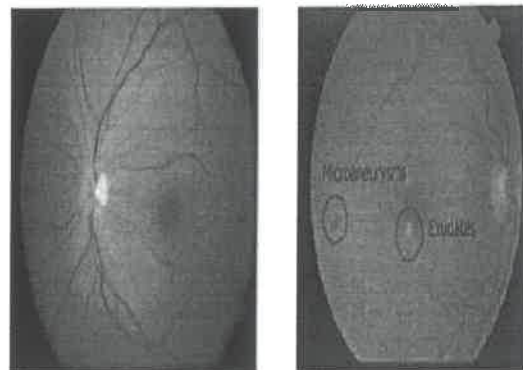


Fig. 1.1 Fundus images. (a) Healthy, (b) DR (with micro aneurysms and Exudates)

Various algorithms have been developed for extracting the exudate candidates, including morphological operation based approaches, e.g. [6], [7], clustering based approaches e.g., [8],

[9] and pixel-level feature based machine learning, e.g. [10], [11]. After the exudate candidates are obtained, generally,

feature extraction and machine learning is used to further classify the candidate points. Zhang et al. extracted 28 features including intensity, geometrical and texture related features for all the exudates candidate, then random forest was utilized for the classification [7]. Garcia et al. extracted 18 features including color and shape features for the exudate candidates and tested different machine learning methods, including multilayer perceptron, radial basis function and support vector machine for the



# Lane Detection for Self-Driving Cars Using Deep Neural Networks

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**Abstract-** Self-Driving Cars research problem requires several sub-topics that need to be discussed more deeply. Such as Deep Learning, Computer Vision, Fusion Sensor, Localization, Control, until Path Planning. All of them are fusion of several fields of study. Video image taken using action camera mounted on top of the vehicle, with 1280x720 resolution. Average speed of the vehicle is 100 km per hour. Image processing method are a combination of methods of colour region, line selection, canny edge detection, Hough transform, Deep neural networks. Deep Neural Networks can find the road lanes accurately with the help of several libraries such as Tensor flow, Kera's libraries to find the accurate road lanes for the self-driving cars to Travel. The result shows this algorithm needed to be add some method that can be changing the road lanes. This system can be useful in avoiding the accidents while changing road lanes. The experiment was conducted on images of test data, training data and validation data using a different number of images, where the length of training data was 1000, length of test data was 720 and length of validation set is 300. Each of the training data samples was trained with 100 epochs. The experiment obtained the highest accuracy of 97% in training result. Meanwhile, in testing result obtained is 4.2 seconds and of accuracy 96% for validation of testing data.

**Keywords:** Road lanes, Deep neural networks, Hough transform, Canny edge detection.

## I. INTRODUCTION

A lane detection system used behind the lane departure warning system uses the principle of Hough transform and Canny edge detector to detect lane lines from real-time camera images fed from the front-end camera of the automobile. Lane departure warning systems combine prevention with risk reports in the transportation industry. View Nyx applies video-based technology to assist fleets in lowering their driving liability costs. Increasing the safety and saving lives of human beings is one of the basic functions of Intelligent Transportation System (ITS). Intelligent transportation

systems are advanced applications which aim to provide innovative services relating to different modes of transport and traffic management. This system enables various users to be better informed and make safer, more coordinated, and smarter use of transport networks. Most roads such as highways have at least two lanes, one for traffic in each direction, separated by lane markings. Major highways often have two roadways separated by a median, each with multiple lanes. To detect these road lanes some system must be employed that can help the driver to drive safely Lane detection is the process to locate lane markers on the road and then present these locations to an intelligent system. Training deep models for lane detection is challenging due to the very subtle and sparse supervisory signals inherent in lane annotations. Without learning from much richer context, these models often fail in challenging scenarios. We present a novel knowledge distillation approach, i.e., Self-Attention Distillation (SAD), which allows a model to learn from itself and gains substantial improvement without any additional supervision or labels.

## II. RELATED PAPER WORKS

Jiman Kim, Chanjong Park [1] introduced "End-to-End ego lane estimation based on sequential transfer learning for self-driving cars" The deep learning understands the world by analyzing the context of a scene, then focusing on important objects and observing them at a hierarchy of levels, from narrow with high resolution, to broad with low resolution. Therefore, when understanding a scene, deep learning is relatively insensitive to variations of environmental condition, and is inexpensive to redesign, to respond to different targets. The authors proposed a method of semantic ego lane estimation to train a deep network based on sequential end-to-end training and to recognize left and right ego lanes without post processing directly and separately. The method uses two transfer learning steps. The first step changes the network's representation domain from a general scene to a road scene; the second step reduces the target from road objects in general, to left and right ego lanes in particular. Also, the end-to-end approach reduces re-design and re-optimization



# Eco-Friendly and Self Powered IOT Using Piezoelectric Energy Harvesting

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**ABSTRACT:** The Internet of Things (IoT) is a revolutionizing technology which aims to create an ecosystem of connected objects and embedded devices and provide ubiquitous connectivity between trillions of not only smart devices but also simple sensors and actuators. Although recent advancements in miniaturization of devices with higher computational capabilities and ultra-low power communication technologies have enabled the vast deployment of sensors and actuators everywhere, such an evolution calls for fundamental changes in hardware design, software, network architecture, data analytics, data storage, and power sources.

A large portion of the IoT devices cannot be powered by batteries only anymore, as they will be installed in hard to reach areas and regular battery replacement and maintenance are infeasible. A viable solution is to scavenge and harvest energy from the environment and then provide enough energy to the devices to perform their operations. This will significantly increase the device life time and eliminate the need for the battery as an energy source.

This project presents the main design challenges of the IoT devices in terms of energy and power and provide design considerations for a successful implementation of self-powered IoT devices. We then specifically focus on piezoelectric energy harvesting as one of the most promising solutions to power the IoT devices and present the main challenges and research directions.

## I. INTRODUCTION

Recent advancements in miniaturization of devices with higher computational capabilities and ultra-low power communication technologies are driving forces for the ever-growing deployment of embedded devices in our world. This will transform any physical object, into an Information source with the potential to communicate with every other thing in the network. This ecosystem of connected things is called the *Internet of things (IoT)*.

IoT applications and services cover almost any sector where embedded devices replace humans in

performing tasks. IoT provides a network of connected devices that real time information can be shared and used in order to enhance life quality, improve industry processes, energy efficiency, and level of services. IoT also significantly improves supply chain efficiencies and develop new services for retailers. Such a network of inter-connected devices enables the factories to get humans and enterprise systems more involved with the whole supply chain system.

Energy harvesting from environment is usually uncontrolled, unpredictable and in most cases the conversion efficiency is low. PV cells provides high power density, but they require constant exposure to light which limits their application in many IoT use cases.

In 1880, Pierre and Jacques Curie measured surface charges that appeared on crystals of tourmaline, quartz, topaz, cane sugar and Rochelle salt when they were subjected to an external mechanical stress, which is called the direct piezoelectric effect.

Energy harvesting techniques are used for harvesting energy from the environment and provide enough energy to the IoT services and applications to perform their operations, they significantly increase the device lifetime and eliminate the need for batteries as an energy source.

## II. METHODOLOGY

### a. INTRODUCTION

Piezoelectric materials can be used to convert oscillatory mechanical energy into electrical energy. The technology together with innovative mechanical coupling designs, can form the basis for harvesting energy from mechanical motion. Piezoelectric energy can be harvested to convert walking motion from the human body into electrical power. Recently proof-of-concept Heel Strike Units were developed where each unit is essentially a small electric generator that utilizes piezoelectric elements to convert mechanical motion to electrical power in the form factor of the heel of the boot. Similarly, this project is to harvest electrical energy by developing a piezoelectric mat to convert



# Perceptual Image Hashing based on Texture and Color

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**Abstract**—This paper proposes an efficient scheme for generating image hashing by combining the local texture and color angle features. During the stage of texture extraction, using Weber's Law, the difference ratios between the center pixels and their surrounding pixels are calculated and the dimensions of these values are further reduced by applying principal component analysis to the statistical histogram. In the stage of color feature extraction, the color angle of each pixel is computed before dimensional reduction and is carried out using a discrete cosine transform and a significant coefficients selection strategy.

The main contribution of this paper is a novel construction for image hashing that incorporates texture and color features by using Weber local binary pattern and color angular pattern. The experimental results demonstrate the efficacy of the proposed scheme, especially for the perceptual robustness against common content preserving manipulations, such as the JPEG compression, Gaussian low-pass filtering, and image scaling. Based on the comparisons with the graphs, the integrated histograms of normalized distances show the superiority of the scheme in terms of robustness and discrimination.

**Index Terms**—Image hashing, Weber's law, local binary pattern, color angular pattern, Gaussian low pass filtering, robustness.

## I. INTRODUCTION

Hashing is the transformation of a string of characters into a usually shorter fixed length value or key that represents the original string. Hashing is used to index items in data base because it is faster to find the item using the shorter hashed key than to find it using the original value. Perceptual hashing is the

process of examining the contents of an image and constructing

a hash value that uniquely identifies an input image based on the content of an image. It is very easy to the tamper with digital data without leaving any clues. Under these circumstances, integrity verification has

become an important issue in the digital world [1]. Hash functions are frequently called message digest functions. Their purpose is to extract a fixed-length bit string from a message. Hash functions have found various applications in various cryptographic, compiler and database search applications [2],[3]. With the development of multimedia technology, human society has entered into an information age that offers convenience in the capturing and transmitting of digital images. Since digital images contain large amounts of data, have high redundancy and low confidentiality, and are insensitive to distortion and easy to edit, the phenomena of digital image replication and malicious tampering is relatively serious, as it can lead to a copyright authentication problem.

Although several digital watermarking methods have been proposed to verify the authentication of images, there are two main issues with this kind of technique: firstly, it causes some degree of image distortion during the process of embedding of a watermark, and secondly, it is necessary to consider the capability of watermark extraction [4]. In addition, due to the increase in the amount of image data, the retrieval of certain required images from a high-volume image database. Perceptually in significant distortions would introduce to images which are widely distributed via internet due to lossy compression channel additive noise etc. Image hashed should be robust such distortion. Also, perceptually significant distortions, example objects insertion and removal to tamer the image could occur images which can be considered as malicious attacks. It is desirable that image hashes sensitive to such punctually significant attacks for the image authentication purpose, An Image as can also serve as a secure tag of an image. Pseudo randomization techniques are generally incorporated in hashing algorithm to guarantee that hash is hardly obtained by unauthorized advisory without the secret key.

## II. PROPOSED SCHEME

At present, there have been many ways being proposed to generate image hashing, which is represented by binary or decimal format. Almost all image hashing methods can be generally classified into two categories: feature extraction and dimensionality reduction in



# Design of WSN Node for Forest Trees against Poaching Using IoT

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**Abstract**— Now a days poaching or smuggling of environmentally and economically important species of trees in forested areas - such as Teakwood, Sandalwood, Pine and Rosewood has been dramatically increased. These trees are very costly as well as less available in the world. These are used in medical sciences as well as cosmetics. Because of huge amount of money involved in selling of such tree, smuggling occurs. It also poses a serious threat to forest resources, causes significant economic damage and ultimately has quite a devastating effect on the environment all over the world. Our project work concentrates on the identification of poaching activities in the forest by using wireless sensor network. We are developing such a system which can be used to restrict this smuggling. A tree will be equipped with one small electronics unit which consists of Micro Controller, MEMS sensor, GPS and IOT module Tree cutting will be detected by sound sensor and MEMS. By using sound sensor we can predict the cutting tree. Once the tree will fall the nearest tree will sense the sound of fallen trees and send the signal to server. Sensor values having some fixed threshold value, once the threshold value will match to the current value, it will send the alert signal to server due to that the forest ranger

May get more alert on that particular area. Our main objective is to develop an system to prevent poaching and deforestation using IOT module.

**Keywords**—WSN, 3-axis mems accelerometer, zigbee, sound sensor, gps.

## I. INTRODUCTION

Now a day's poaching or smuggling of environmentally and economically important species of trees in forested areas - such as Teakwood, Sandalwood, Pine and Rosewood has been dramatically increased. There have been several initiatives undertaken by different stakeholders – and in particular- by the Govt. of India, to mitigate these problems. These include the recruitment, training and deployment of anti-poaching watchers and/or private/govt. Security guards across forests. Strict punishments for convicted offenders .

However, the punitive measures have remained largely ineffective, but still poachers were continuing to thrive. The most effective solution is– “the implementation of a real time, wireless sensor network (WSN) and data logging system” which will be an advanced and a cheap

modern technology to make monitoring more robust, effective and feasible.

Here wsn (wireless sensor network )technique is adopted cause,WSN is a most emerging technology, widely used in many industrial applications such as monitoring, maintenance, security and control application, specific in remote monitoring applications etc. In forest areas, WSN are widely used for fire detection in forest, to detect rearing/poaching of animals, for environmental monitoring, etc.

Wireless Sensor Network facilitates easy installation and maintenance; they eliminate the use of expensive cables and save costs. With the help of WSN and some other sensors we can implement the system which used to reduce the poaching level in the forest areas.

For monitoring large areas, there is a need for an automated system for longer lasting solution Tracking applications, I.e., GPS However, the punitive measures have remained largely ineffective, but still poachers were continuing to thrive.

## II. PROPOSED METHOD

The proposed system consist of a wireless sensor network, (sink node) base station and the mobile app that used for the surveillance of trees over the internet. The wireless sensor network (WSN) consists of client sensor node and master sensor node in the network.

Each client sensor is connected to master sensor node, with a range limit of 100m. Every master node in the network are connected by zigbee module.

Thus, the WSN is formed and ends up connecting to a sink node i.e., base station. In the base station the information from the master node is processed and sent to the cloud. With the help of a mobile application, the data from master node is viewed with its GPS location.

1. client trees acts as a sensor node .each sensor node will have sensor input as data of accelerometer along with the address given for each clien tree with the help of encoder.



# An IOT Based Smart Inverter

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**Abstract**—The industrial revolution in power has become the foremost fundamental element required to fuel an economy. Every section like industries, homes, and the government itself is heavily hooked into power for its smooth functioning. Hence, it's time we use renewable energy sources so as to scale back pressure on power grids. Therefore, it's extremely important to specialize in the concept of energy generation using renewable sources and energy storage in an efficient manner to scale back the pressure on power grids. Energy storage comes in handy during emergencies like floods, storms, breakdowns, etc. which end in long power cuts. The population explosion has also resulted during a power shortage and consequential power cuts. But with the ever rising technological advances, the inverter is predicted to be much smarter than it is now. A sensible inverter must use renewable energy to charge its battery, it should be adaptive and ready to send and receive messages quickly, also as share data with the owner. Hence there's scope for retrofitting the prevailing inverters to form them more user-friendly by displaying the battery voltage and also providing information on the run-time of his loads while using the battery, which can also promote the use of obtainable energy by the buyer.

**Index Terms**— Smart inverter, ESP8266 Wi-Fi module, IoT, Blynk server, Arduino mega 2560.

## I. INTRODUCTION

Thanks to the economic revolution, strength has emerged because of the maximum essential detail required to fuel an economic system. Every phase of society like industries, homes, and therefore, the government itself is closely hooked into strength for its easy functioning. However, population expansion has led to increasing involvement in power. Pollution thanks to conventional electricity resources is already at an all-time excessive. Hence, it's time we use renewable energy assets to be ready to lessen pressure on power grids. Therefore, its miles extraordinarily vital to the awareness at the thought of energy era the usage of renewable assets and strength storage of power-efficient to reduce the strain on strength grids. Energy garage comes in available during emergencies like floods, storms, system failure then forth which causes long energy cuts. The population explosion has additionally resulted during a strength scarcity and

consequential energy cuts. But with the ever-growing technological advances, the inverter is predicted to be an entire lot smarter than its miles now. A method of doing it to allow the patron to monitor its reputation remotely. From this we mainly consider monitoring the battery charging status, displaying the run- time of the hundreds and controlling of loads wirelessly. Inverters discovered in most families and industries are powered with the help of non- renewable.

Strength sources and are primitive in their architecture and usage. Most purchasers are caught off-protect while the inverter's battery dies out because the prevailing inverters lack the power to alert the users approximately the energy consumption and battery lifestyles last. A sensible inverter needs to use renewable strength to feed its battery, it should be adaptive and capable of send and acquire messages fast. Hence, there's scope for retrofitting the prevailing inverters to form them more user-friendly by displaying the battery voltage and also providing information on the run-time of his loads while using the battery, which can also promote the judicious use of obtainable energy by the buyer. Through this work, the said objectives are as follows:

- To make an interactive IoT-enabled smart inverter which is charged by a solar PV panel and may display the prevailing battery voltage at any point in time
- To permit the user to then decide which crucial loads to run within the event of an influence failure and key in his preferences onto the provided GUI like an internet page/Mobile application
- To allow the user to regulate the chosen loads wirelessly, through a GUI like an internet page/Mobile application
- To then display to the user on how long he can run the chosen loads simultaneously or individually

## II. LITERATURE SURVEY

The inverter and routers are commonly found in most households today [1]. Implementation of a sensible inverter that uses Wi-Fi to interact during a two-way communication with the user of both, the battery voltage of the inverter also as run time of the hundreds which the



# Storm Water Harvesting in Urban Pavements by Using Pervious Concrete

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**Abstract:** Due to modern urban development and improper drainage system, flooding has become common in India. Study suggests that use of pervious concrete is cost effective and eco-friendly. The use of pervious concrete consists of high permeability, low strength and high porosity when compared to the normal pavement or normal concrete. The aggregates are single size bonded with only cement paste which also omits the usage of fine aggregates thereby forming intercellular structures, which allows the storm water to seep into ground for recharge of ground water table by reducing the runoff of water on the surface. During the excess flow of storm water which cannot percolate the ground water surface enters the storage tank which is provided adjacent to the roads or beneath the surface of the footpath. The water which is stored in the storage tank can be used for external applications. However the concrete surface affects the tyres and creates noise, by using pervious concrete or exposed aggregate concrete it can be reduced.

**Keywords:** Pervious concrete, storm water, ground water recharge, storage tank, external applications.

## I. INTRODUCTION

Pervious pavements are alternatives to traditional to asphalt and concrete. They permit water to undergo soil below, reduce storm water and recharge groundwater. Pervious pavements are utilized in many parts of the planet to enhance wet weather driving safety, reduce traffic noise and manage storm water runoff. Pervious and interconnected structure pore allows that water to simply penetrate into it and convert this sort of pavement to eco-friendly pavement. Pervious concrete is homogenous mixture of cement, aggregate/gravel and water where this sort of concrete is additionally called as no-fines concrete. Pervious concrete could even be a special high porosity concrete used for flat work applications that consents water from precipitation and other sources to undergo it, thereby reducing the runoff from a site and recharging spring water levels. Pervious

concrete are produced using large aggregates with little to no fine aggregates. Pervious concrete is traditionally utilized in parking areas, areas with high traffic, residential streets, pedestrian walkways, and green houses. It is an important application for sustainable construction and is one of many low impact development techniques employed by builders to project water quality. The use of pervious concrete is recognized as best management practice by US environment protection agency for providing first flush pollution control and storm water management. High impact development within the areas of transportation infrastructure by the development of conventional concrete pavements is transforming the natural pervious ground into an impervious land cover, the development of conventional impervious pavement systems has caused two major shifts within the local environment including changes of hydrological aspects and variations within the surrounding thermal ambience. Pervious pavements with reservoir structure of concrete paving-stones offer the likelihood for a decentralized, sustainable storm water management and source control in urban areas. Runoff from streets and parking areas with low traffic densities are often infiltrated to support spring water recharge and to scale back hydraulic stress in sewer systems, receiving waters and wastewater treatment plants. Infiltration can help to return the urban water cycle to its natural condition, increasing spring water recharge and evapotranspiration. Hence by evaluating the consequences of various admixtures of pervious concrete block the strength and permeability balance is decided. The most objective is to scale back the stagnant and runoff of the water by allowing it to percolate into ground surface.

Pervious concrete has very rough an uneven appearance thanks to the consistent of cement, coarse aggregate, admixtures (fly ash or pozzolana or ground granulated furnace slag (GGBS)) with little to no fines aggregates and water.





# Experimental Study of Strength Characteristics on Self Compacting Concrete by Partial Replacement of Cementitious Materials

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**Abstract :** In present scenario innovation in the construction industry is increasing rapidly. A self compacting concrete [SCC] is the one that is able to flow under its own weight and fills the formwork without any vibrators. This helps in increase of speed in construction and reduction of onsite man power. This project aims at highlighting the strength

Characteristics of self compacting concrete with combination and cementitious material like alccofine, GGBS and fly ash. Alccofine is a finer particle than the cement, silica etc which obtained from the slag of the high glass content. Investigation for a different mix proportional like 3 trails with 100% complete cement for first mix and 70% cement 10% GGBS 10% fly ash 10% Alccofine is for second mix and for third mix is of 70% cement 10% Alccofine 20% fly ash. self compacting testing have been carried out for fresh concrete and harden concrete as workability compressive strength, split tensile strength, flexural strength from viewpoint of making SCC with cementitious material as a successful outstanding concrete.

**Keywords—** Self compacting concrete, Alccofine, GGBS, Fly ash, compressive strength, Split tensile strength, flexural strength.

## I. INTRODUCTION.

Self-compacting concrete(SCC) is the one that settles down under its own weight and does not require any vibratory machine to settle down. It was first developed in Japan in 1988. When the construction industry was experiencing a decline in the availability of skilled labour in the late 1980s, to overcome the defects of workmanship this concrete came into picture. At first it was named as High Performance Concrete and later it was called by the name Self Compacting Concrete. SCC is a good alternative for conventional concrete especially

in congested formwork where compaction is not easy and in those situations work with SCC is preferred.

## OBJECTIVES

The main objective of the project work is to determine the strength characteristics of Self compacting concrete (SCC) when the cement is replaced by mineral admixtures in different proportion and hence graphs are plotted.

## II. METHODOLOGY AND MATERIALS

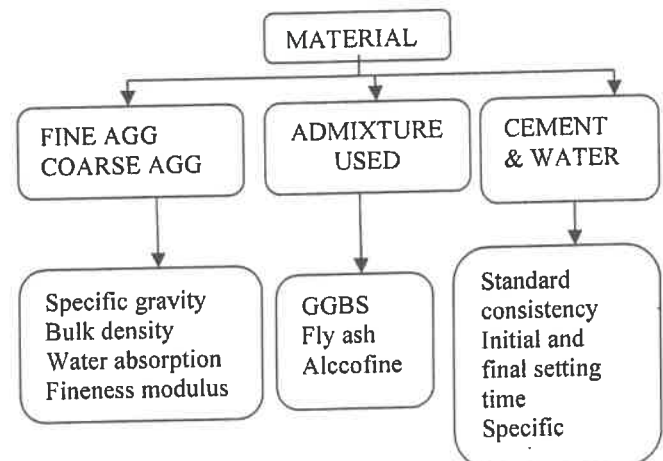


Fig 1: flow chart of methodology

### A. FINE AGGREGATES

The fine aggregates used for the project belongs to zone 2 the materials passing 4.75mm sieve are only considered as fine aggregated then it cleaned to remove unwanted particles.



## Safety on Roads under Low Visibility

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**Abstract:** It is known that crashes tend to be severe in low visibility condition than under normal clear conditions. The effects of low visibility are one of the major concerns in the road safety. In this case the visibility tends to turn zero due to fog and heavy rainfall. In this study we bring in contrast the implementation and design of accident avoidance system using Arduino and ultrasonic sensors. The ultrasonic sensors can detect the static position of the vehicle and transmits information to the warning system and provides information to the driver behind. And we also use coding for this project in order to connect the ultrasonic sensors to Arduino. We use an Arduino software for connecting both the devices. After that we need to fetch the code and if it runs without any errors then the devices can be used.

**Keywords:** Low visibility, Fog, Arduino, Ultrasonic sensors.

### I. INTRODUCTION

Over Few Decades, Safety over Transportation is gaining attention because of frequent deaths around the world. Traffic Hazards is one of the major issues to be dealt with when it comes to transportation. Surveys have been conducted and found that the source of majority deaths across the world is due to road accidents. Hence there is a need to provide better transportation facilities that could reduce traffic hazards and save peoples life.

Adverse weather conditions in the atmosphere cause serious harm to road traffic system, especially under low-visibility conditions related to fog. Previous studies have found that traffic accidents are more likely to happen under low-visibility conditions, and most of them are secondary accidents or multi-vehicle collisions under low-visibility conditions, which leads to more serious consequences (Accident occurred in Yamuna Expressway in Greater Noida) The low-visibility conditions severely affect drivers' line of sight, which can lead to lack of judgment of road geometry and the real-time traffic flow system.

Human error is the most dominant factor in traffic

crashes. This error ranges from complete negligence (e.g., distracted or impaired driving) to limitations of human abilities (e.g., slower reflexes with age, low visibility in inclement weather). One limitation that is usually neglected is low visibility during drizzly weather. To reduce the frequency of crashes that occur in inclement weather, it is necessary to investigate the key factors associated with these crashes thoroughly. This study will help us to identify the effects of decreased visibility on the likelihood of crashes and the factors that influence crashes during periods of decreased visibility.

In this work, a warning system is designed using Arduino and ultrasonic sensors for accident detection and prevention.

Some of the major objectives that have been focused are

- Detection of static position or Accident of a vehicle.
- Warning the upcoming vehicles, through the warning system.

The structure of rest of the paper is discussed as below. Section II discusses about the Existing works, Section III discusses about Methodology, Section IV discusses about proposed work. Finally, Conclusion and References were discussed.

### II. EXISTINGWORK

Several Literature paper have been studied and analyzed for the System Design. Several pitfalls in the existing works have been identified. In one of the paper[1], the authors have mentioned the existing technologies and discussed about intelligent transportation system. The existing work is based on RFID and ARM controller to minimize the traffic hazards. However, RFID communication can only be effective when there is strong RF Signal strengths. In [2], VANETS technology is used to Avoid Traffic hazards using DSRC technique. In [3], Survey on various technologies have been considered such as VANETS, Wireless networks. In [4], IOT solution is provided to avoid road accidents. This survey paper could be used as a reference in the



# Corrosion behaviour of Al-Mg-Si alloy based hybrid composite in different ageing conditions.

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**Abstract :** Metal Matrix Composites play an important role in today's world and can be an alternative to conventional materials in a number of specialized application areas. It has been demonstrated that aluminium matrix composites reinforced with various discontinuous reinforcement materials have great potential for application in marine, automobile and aerospace industries. A study on Corrosion behavior of Al-Mg-Si (Al 6061) based hybrid composites containing mica particulates of 200 microns and short e-glass fibers of 2-3 cm length in different compositions are studied with different aging conditions. Vortex type of stir casting was employed in which preheated reinforcements were introduced. The test specimens were subjected to solution heat treatment and artificial ageing. Double aging was carried out on the specimens with strain and without strain (compression). Corrosion test was performed using dip method in various solutions. Considerable improvement in corrosion resistance was observed in double aged with strain over double aged without strain, single aged and as-cast condition. The microstructures of the composites were studied to know the dispersion of the mica and e-glass fiber in matrix. It has also been observed that addition of reinforcements significantly improves the corrosive resistance as compared with that of unreinforced matrix.

**Keywords:** Corrosion, Mica, E-glass, Al-Mg-Si alloy, Al6061 hybrid composite, single aging, double aging, Straining.

## Introduction

Development of an Aluminium Matrix Composites (AMCs) with attractive corrosion resistance has considerable importance in recent years, as it has lot of applications in marine and automobile sectors. AMCs also exhibit better mechanical properties than unreinforced aluminium alloy. They have high ratio of strength/density and better wear resistance, hence find ample applications in tribological parts. Hence Metal Matrix Composites (MMCs) have received increasing attention in recent decades as engineering materials. The introduction of a ceramic material into a metal matrix produces a composite material that results in an attractive combination of physical and

mechanical properties, which cannot be obtained with monolithic alloys (1-6). There is an increasing need for knowledge about the processing techniques and corrosion behaviour of particulate MMCs in view of their rising production volumes and their wider commercial applications (7).

The most conventional method of production of composites by casting route is vortex method, where the liquid aluminium is stirred with an impeller and ceramic particles are incorporate into vortex formed by stirring of the liquid metals. Addition of Mg into the liquid metal reduces the surface tension (8) and there by avoids the rejection of the particles from the melts. Hence 1-2% of Mg is generally added to the aluminium melts before adding the particles. Multi-stage heat treatment known as retrogression and re-ageing (RRA) is a process used to enhance the mechanical and corrosion resistance properties of aluminium. The RRA process was first developed by Cina and Gan and their results showed that 7xxx series of aluminium alloys are known to respond to retrogression and re-ageing thermal treatments (9). It is also understood that the microstructure in Al2024 with and without a 6% stretch prior to aging for 12 h at 175 °C gives better strength/fracture toughness relationship during stretching as the number density of precipitates increases. (10). This paper presents preliminary findings on the influence of

straining, aging and re-ageing called double ageing on the corrosion behaviour of aluminium alloy 6061 based hybrid composite.

## Materials and Methods

### Matrix Material

Al 6061 alloy, which exhibits excellent casting properties with reasonable strength, was used as a matrix material. This is a popular aluminium alloy with good strength and is suitable for mass production of starting lightweight metal castings. The chemical composition of the Al 6061 alloy is shown in the Table-1. White Mica of 200 microns was selected as particulate form reinforcement. E-Glass fibre of 2-3 mm length and 0.2mm in diameter is also considered as fibre



# Cryogenic Treatment on Tungsten Carbide Tools: Review

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**ABSTRACT :** The purpose of cryogenic treatment is to improve tool life of tungsten carbide tools has been developed from past few years. At present many papers about tungsten carbide material has reported on laboratory test results. The fine dispersed carbides precipitation has been widely observed and their effects on tool life have been measured. In addition, some recent studies have pointed out the application in machining process by cryogenically treated tungsten carbide tools. The present paper summarizes the state of the art about cryogenic treatment of tungsten carbide tools focusing on cryogenic treatment methods, parameters, and results.

**Keywords:** Tungsten carbide, Tool life, Cryogenic treatment

## 1. INTRODUCTION

Machining is the process of removing material from a work piece in the form of chips. Metal cutting is among the oldest and most important material shaping

processes which is widely used in the automotive, railway, ship-building industries, aircraft manufacture, electronics and it involves turning, Boring, milling, drilling and shaping operations.

## 2. Tungsten carbide

Tungsten carbide (WC-Co) is extensively used as cutting tool material. It has different types of tool grades with different hardness. Different grade are used for the different material. Tungsten carbide is a composite which contain the Tungsten, Cobalt (6%), Titanium and Niobium. Tungsten carbide is the product of powder metallurgy in which the powder of tungsten carbide is mixed with the cobalt binder. This mixture goes through mixing, compacting and sintering process to get the final product. Tungsten carbide is a refractory material. It has high hardness and wear resistance. Tungsten carbide was synthesized by the French chemist Henri Moissan in the 1890s. The first cemented carbide product was tungsten carbide. This material was used to replace expensive diamond dies.

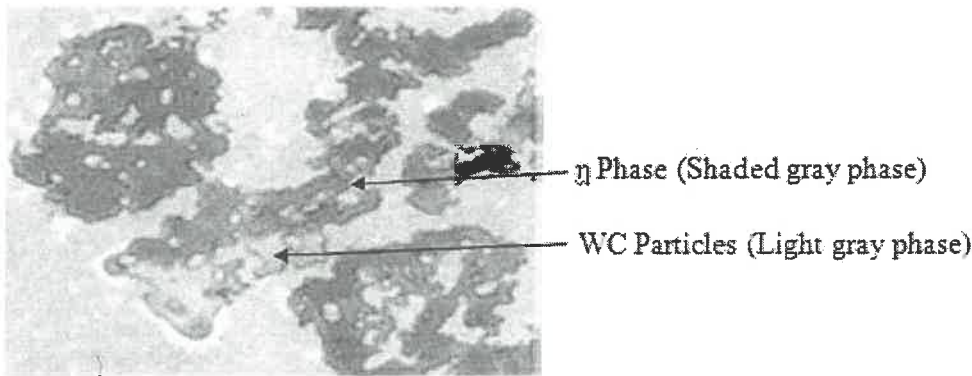


Figure 1: Microstructure of WC-Co material [10]

### 2.1 Tool Life

Tool life usually indicates the amount of satisfactory performance by a cutting tool till it starts manufacturing defective parts. Various studies define the tool life in their own way [1, 3].

Tool life is always expressed by span of machining

period in minutes, whereas in industries besides machining time in minutes some other means are also used to assess tool life, depending upon the situation, such as

- Total volume of material machined
- Number of work pieces produced