International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 08 | Aug 2020 www.irjet.net p-ISSN: 2395-0072
National Conference on Recent Advancements in Communication, Electronics and Signal Processing-RACES'20
Organised by: Department of ECE, Velammal Engineering College, Chennai-66

# RESIDENT INTRUSION DETECTION USING WI-FI ENABLED IOT FOR SMART HOME WITH ANDROID SUPPORT

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***Abstract*** -Innovation and automation has made our life simple, home automation is one such emerging technology which empowers the residents to have wireless and provides security to the home. There is a plethora of IoT setups available but most of them have restricted compatibility and are tailor-made for manufacturer supported devices. In order to provide a cost-efficient solution, a generic, all product supporting Wi-Fi based remote home automation scheme using a Raspberry PI, PIR sensor and a vibration sensor is proposed. The connected devices are monitored and controlled through a mobile application from anywhere across the globe. Various sensors like Vibration sensor to detect vibration and PIR motion sensor to sense the movement in the area of deployment are used to comprehensively monitor the ambience of the home environment. Through Android application continuous monitoring of the house is possible and Text to speech conversion helps in communication with the visitors.

**Keywords -security; smart home; internet-of-things (IoT); Intrusion Detection System, Intruders.**

## I. INTRODUCTION

The intrusion detection is a software which is used to detect malicious activities or abnormalities, the intrusion detection along with IOT enables the devices of everyday use to be networked together. With the development of IOT the intrusion detection can be integrated with various sensors. With intrusion Detection and video monitoring using IoT devices, the systems in smart buildings or homes are able to actively obtain the information of occupancy and continuously monitor the house. Nowadays the Security in the house is compromised so the smart home system has become a necessity. The Smart.home system enhances the home security by continuous monitoring.

## II. LITERATURE REVIEW

In [1], Waheb A. Jabbar postulated various conventional techniques for monitoring homes and their security. It uses a prototype, IoT@HoMe developed with an algorithm to monitor our home conditions and control the home appliances over the Internet anytime and anywhere.

In [2], Qiuyan Lyu provides the users with control of smart devices, but the smart homes are facing many issues in the privacy and confidentiality side when accessed remotely. This focuses mainly on providing secured authentication through third parties than concerns about privacy leakage. In our system, we use a scheme IFTTT which aims in remotely accessing our home system more privately.

In [3], Weixian Li here deals with the energy consumption and meter readings which can be made digitally, by reducing the manual work. But the smart home network is vulnerable to energy theft. In our system, we use a smart energy theft system (SETS) that is used for prevention from energy thefts, despite the lack of energy monitoring devices. And enhance the security of the IoT-based smart home.

In [4],It explains about intrusion which takes place based on various cyber attacks. In the current system, we propose an Intrusion Detection System[IDS] to detect the motion of any intruder based on their character and identify the type of attack that has been deployed. This distinguishes the type of network, whether malicious or not and easily detects when the attack has taken place.

In [5], It explains about not having control over our homes when not present. So, we can't always monitor our home's condition, and it may lead to any mishappening at times. Our system provides accessibility to monitor and

# PREDICTIVE ANALYTICS ON CARDIOVASCULAR DISEASE USING MACHINE LEARNING CLASSIFICATION TECHNIQUE

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***Abstract*** *— Most of the people are not conscious about their health issues. Heart diseases are more dangerous as most of the cases are reported at critical times only.*
*The heart disease prediction is made using machine learning techniques such as SVC, RFC, Logistic Regression and KNN algorithms which helps in attaining accuracy. The growth of machine learning is reaching heights which will eventually lead to better results than that of past. The previously implemented model considers various algorithm which leads to undersized results. The ultimate aim of the project is to make prediction of heart disease at early stages and protect them from risk with a negligible amount of cost and time.*
***Keywords*** *—Machine Learning, Data Mining, SVC, RFC, Logistic Regression, KNN.*

## I.INTRODUCTION

In the fast running world, the day to day activities deals with quick actions but not healthy once, most of the time healthy things won't come along with quick actions. In this kind of situation, people must be aware about their health. In comparison to other diseases, cardio vascular disease is more serious as the problem would have crossed the safer line when people start to pay attention. The main aim of the project is to say to an individual that he/she has a possibility of getting cardio vascular disease based of their daily habits and body conditions. We mainly use SVC, RFC, Logistic Regression and KNN classification algorithms for prediction using the data set of more than 300 patients.

In the further paper we will have section II as motivation of the project. The process of machine learning and data mining in section III.A brief understanding of survey in section IV. Drawbacks in previous model has been discussed in Section V. Methodology of the project is discussed in section VI. The Status Outcome will be viewed in Section VII. Towards the end, the conclusion is discussed in Section VIII.

## II. MOTIVATION

This project is an initiation of medical field to reach every individual with negligible cost and time to lead a better healthier life. The main goal of the project is to strain any individual to a minimal level by answering few questions, and provide them a much accurate results of having vascular disease in the future or not. If the result is positive then that person must have a complete check-up following a consultation of a doctor and must have healthy foods with a regular exercise. In case the results are negative then they can continue the regular habits.

## III.DATA MINING

# Road Accident Prediction by Comparing Measurements using Ensemble Learning Method

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*Abstract*— **At present, road transport infrastructure fails to cope up with the exponential increase in vehicular population. Computing the fastest driving routes and predicting accidents in the presence of varying traffic conditions is an essential problem in modern navigation systems. In this paper, we investigate the transport department dataset with ensemble learning method for finding the best road selection. The results predict the best accuracy calculation using comparison of supervised machine learning algorithms. In statistics and machine learning, ensemble methods use multiple learning algorithms to obtain better predictive performance. The analysis of dataset by supervised machine learning technique (SMLT) captures several information like, variable identification, uni-variate analysis, bi-variate and multi-variate analysis, missing value treatments and performs the data validation, data cleaning/preparing. Adding to it, data visualization will be done on the entire given dataset. Additionally, it compares and discusses the performance of various machine learning algorithm measurements from the given transport department dataset with evaluation of GUI based road accident prediction by given attributes.**

*Keywords*— ***Dataset, Ensemble method, Machine Learning algorithms, GUI results.***

## I. INTRODUCTION

There are several problems with current practices for prevention of the accidents occurred in several localities. The data collected is analyzed, integrated and grouped together based on different constraints using the best suited algorithm. This estimation will be helpful for analysis and identify the flaw and the reasons of the accidents. It will be helpful while making roads and bridges as a reference to avoid the same problems faced before. The predictions made can be very useful in planning the management of such problems. The classification and regression model of road accident analysis can be done by a single classifier. Either KNN or SVM is enough to classify and predict the target variable. Therefore both of them are used together in this approach to make it as an ensemble method. Classification problems using ensemble learning model can give better accuracy than others.

The scope of this paper is to investigate a dataset of transport department records using ensemble learning technique and to identify the best road selection by accident reports.

The goal is to develop a machine learning model for real-time accident forecasting by predicting results in the form of best accuracy by comparing supervised algorithm with mean value from voting classifier results. The main objective of the road accident prediction system is to analyze the previously occurred accidents in the locality which will help to determine the most accident-prone area and set up the immediate required help and to make predictions based on constraints like weather climate, road structure, etc. The rest of the paper is organized as follows:
Section II deals with the Literature Review from which the base ideas were adopted.
Section III covers the Problem Definition of the existing system and the proposed system.
Section IV deals with Solution using ensemble learning.
Section V covers with the Applications of the Ensemble Learning method.
Section VI deals with the Future Enhancements and Conclusion.

PROCEEDINGS ON INTERNATIONAL E-CONFERENCE ON INNOVATION IN RURAL EMPOWERMENT, SOCIAL DYNAMICS AND WELFARE IN INDIA - 15/09/2020 (ISBN: 9789387748361)

# Dynamic Pricing of demand curve using price optimisation using data analysis

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*Abstract*— **With the growth of the human population comes the constantly rising demand for agricultural products. Nevertheless, as the world experiences climate change, many crops are often damaged by weather conditions. This study utilizes price optimization to monitor the price factors factors on a farm. The collected data underwent on data cluster analysis to yield analysis of the environmental factors of that farm. The proposed scheme bears the following features: (1) data analysis is achieved via the combination of graph moving average and average variance; (2) we applied 3D cluster analysis to analyze the relation between environmental factors and subsequently examine the rules of thumb held by the farmers;(3) the system determines whether a selected crop has been placed in the appropriate cluster; and (4) the system sets a critical value in the cluster based on future environments and provides advice on whether a crop is suitable for the farm. We placed price optimization in the farm for monitoring purposes and ran an actual-scenario analysis using the algorithm in our study; results confirm that our proposed scheme is indeed feasible.**

***Keywords***— ***Dataset, price optimization method, data analysis, GUI results.***

## I. INTRODUCTION

With the growth of the human population comes the constantly rising demand for agricultural products. According to study [1], the global population is expected to rise from 1.8 billion in 2009 to 4.9 billion in 2030, leading to drastic rise in demand for dairy products. Study [2] suggests that, in the future, human beings will have a growing demand for agricultural products, which will require expansion of farm lands and growth in yield of agricultural products. Mean- while, due to global warming, crops are often damaged by extreme weather conditions. Study [3] points out that coun- tries around the globe are investing in the development of Intelligent Agriculture out of concern for food crisis. For instance, as mentioned in study [4], many farms have begun to rely more heavily on natural resources – such as utilizing hydropower, geothermal energy, or solar power – in order to reduce cultivation costs, especially in water resources. Study [5] argues that lack of labor force will become a serious follows:

Section II deals with the Literature Review from which the base ideas were adopted.
Section III covers the Problem Definition of the existing system and the proposed system.
Section IV deals with Solution using ensemble learning.
Section V covers with the Applications of the Ensemble Learning method.
Section VI deals with the Future Enhancements and Conclusion.

## II. LITERATURE REVIEW

The materials reviewed vary significantly in form and methodology. 60% of all materials reviewed directly address positive and/or negative social impacts in the cotton sector in one or more of the focus countries. (See 'Evaluation of Research' for an explanation of the status of different forms of research.) These materials have been categorized within a spreadsheet database. The research is organized by country, theme, name of the publication, date, author, form of research and research methodology, focus on agriculture/cotton, geographical region covered and, where available, web link. Each publication was then summarized to give a broad overview of the key findings and issues raised. The materials identified are derived from more than 80 different sources, including academic and technical journals, studies undertaken by international and intergovernmental organizations, national government census data, as well as studies by non-governmental organizations and independent research centers.

### 2.1 PRECISION FARMING

Efficient market information can be shown to have positive benefits for farmers and traders. Up-to-date information on prices and other market factors enables farmers to negotiate with traders and also facilitates spatial distribution of products from rural areas to towns and between markets.[4] Most governments in developing countries have tried to provide market information services to farmers, but these have tended to experience problems of sustainability. Moreover, even when they function, the service provided is often insufficient to allow commercial decisions to be made because of time lags between data collection and dissemination.[5] Modern communications technologies open up the possibility for market information services to improve information delivery through SMS on cell phones and the rapid growth of FM radio stations in many developing countries offers the possibility of more localized information services. In the longer run, the internet may become an effective way of delivering information to farmers. However, problems associated with the cost and accuracy of data collection still remain to be addressed. Even when they have access to market information, farmers often require assistance in interpreting that information. For example, the market price quoted on the radio may refer to a wholesale selling price and farmers may have difficulty in translating this into a realistic price at their local assembly market.[6]Various attempts have been made in developing countries to introduce commercial market information services but these have largely been targeted at traders, commercial farmers or exporters. It is not easy to see how small, poor farmers can generate sufficient income for a commercial service to be profitable although in India a new service introduced by Thomson Reuters was reportedly used by over 100,000 farmers in its first year of operation. Esoko in West Africa attempts to subsidize the cost of such services to farmers by charging access to a more advanced feature set of mobile-based tools to businesses.

Co-operation among farmers is believed to contribute to the adoption of technological advances and marketing and commercial innovations, and the presence of co-operatives has been associated with agricultural growth and higher standards of living for farmers. This paper looks at the extent to which co-operatives for the production and marketing of agricultural products diffused in 13 countries during 1880–1930. Despite their important advantages, co-operatives spread slowly in Western countries before 1930. Co-operatives were mainly adopted in export countries, and most of the output of these societies was commercialised abroad or in markets substantially distant from the producing areas. Co-operatives were successfully formed where one crop system dominated and the density of production was high.

### 2.2 MARKETING AND YEILD PRODUCTION:

Marketing is any activity that leads you to sell a product. When you decide what products to sell, what price to ask, where and how to sell them, and how to promote them, you are marketing. Your strategy is your means of doing something -- how you will meet your objectives of selling this year's crop. Depending on the type and size of your farm, and whether you are farming full or part time, you have several options for how to market your operation.

Organic farming is a product strategy -- it defines the type of product you are selling. Farmers select organic farming

Proceedings on International E-Conference on Innovation in Rural Empowerment, Social Dynamics and Welfare in India - 15/09/2020 (ISBN: 9789387748361)

# ESTIMATING THE REVENUE OF CHEMICAL PRODUCTION USING CART(CLASSIFICATION AND REGRESSION TREES)

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**ABSTRACT-The amount of information needed to acquire knowledge on today's acquisition systems is growing exponentially due to more complex, higher resolution, software-intensive acquisition systems that need to operate in System-of-Systems (SoS), Family-of-Systems (FoS), Joint, and Coalition environments. Unfortunately, the tools and methods necessary to rapidly collect, aggregate, and analyze this information have not evolved as a whole in conjunction with this increased system complexity and, therefore, has made analysis and evaluation increasingly deficient and ineffective. The Test Resource Management Center's (TRMC's) vision is to build a DoD test and evaluation (T&E) knowledge management (KM) and analysis capability that leverages commercial big data analysis and cloud computing technologies to improve evaluation quality and reduce decision-making time. An evaluation revolution, starting with the Joint Strike Fighter (JSF) program, is underway to ensure the T&E community can support the demands of next-generation weapon systems.**

The true product of T&E is knowledge ascertained through the collection of information about a system or item under test. However, the T&E community's ability to provide this knowledge is hampered by more complex systems, more complex environments, and the need to be more agile in support of strategic initiatives, such as agile acquisition and the 3rd Offset Strategy. This increased complexity and need for speed cause delayed analysis and problems that go undetected during T&E. The primary reason for these shortfalls is antiquated tools and processes that make data hard to locate, aggregate, and convert into knowledge. In short, DoD has not evolved its evaluation infrastructure as its weapon systems have evolved.

Conversely, commercial entities, such as medical observation and diagnosis, electric power distribution, retail, and industrial manufacturing, have embraced agility in their methodologies while modernizing analytics capabilities to keep up with the massive influx of data. Raw physical sensors could provide data, higher-quality image or video cameras, radio frequency identification (RFID) devices, faster data collectors, more detailed point-of-sale information or digitized records, and ultimately is providing more data to analysts in size and complexity than ever before. As more data has become available, an interrelated phenomenon is the desire of analysts to ask more detailed questions about their consumers and their business infrastructure. To drive the process of implementing big data analytics, businesses have begun establishing analytics centers which either take pre-defined business cases and apply methods to address them or implement existing knowledge within the data architecture to create a higher level of awareness to business groups or the company at-large. To meet these demands, data storage and computation architectures have become more sophisticated, dozens of technologies were developed for large-scale processing (such as Apache Hadoop or Green Plum), and streaming architectures which allow data to be processed and actioned on in real-time as it is collected have become commonplace. The net result of these commercial best practices is a solid foundation for the DoD to transform how it uses data to achieve faster, better, and smarter decisions throughout the acquisition lifecycle.

***Big Data, Data Analytics, Knowledge Management, Data Management, Virtualization, Cloud Computing, Predictive Maintainance, Department of Defense, Test and Evaluation***

## I. KNOWLEDGE MANAGEMENT

Embracing big data analytics in the DoD starts with improved knowledge management. Today, acquisition system data is generated and stored in locations across the globe over many years of prototyping, development, testing, upgrading, and fielding. The result is T&E data that is currently isolated and compartmentalized with little discovery or reuse outside of each respective acquisition program. Consequently, many programs across the DoD are continually reinventing the wheel or rerunning tests that another program has already performed. This redundancy is often because program managers and analysts simply do not know that a similar test was performed within another program. They do not know what is already known, or where to go to access the knowledge. A more systematic reuse of knowledge across the DoD will result in a substantial cost benefit as T&E data collected by one program is valuable for reuse by another.

There are four major functional areas of KM: 1) gathering data into the KM system; 2) warehousing the data for long periods of time while making it available to users in a timely fashion when they need it; 3) providing analysis tools and capabilities, such as big data analytics (BDA), that

# Gauge the Behaviour of Mobile Application Customers

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***Abstract*— The advancement in technology has paved the path for the entire world to be digitalized. This makes anyone from anywhere to get anything using mobile applications. However, not many applications seem to be providing the customer requirements exactly and hence leads to the application's uninstallation. This problem can be resolved by understanding the difficulties or inconvenience experienced by the user. This requires deep analysis of what each and every component of the application provides to a user. The clear analysis of the behavior of application user helps in understanding the commonly flawed parts of the mobile application and help in deriving a solution to the problems in the application and make it more user friendly and improve retention of the application users. This paper surveys the different approaches of customer retention, behavioral analysis of users along with their advantages and disadvantages and find the best method for behavioral analysis of a mobile application user. This reviews the ways to retain the users and reduce the rate of uninstallation of the mobile application.**

**Keywords—Behavioral analysis , Markov chain and ML model, customer segmentation , clustering algorithms**

## I. INTRODUCTION

Today the amount of data available is very huge and the amount keeps multiplying enormously per unit time, there is a lot of conclusions and strategies that can be derived from the data available with proper transformation and extraction of information from the data. Now a days almost every organization depends on the analysis of the data of their customers, products, market and business processes. This clearly shows that every organization has some component of it that is data-driven. Therefore, a quantitative and qualitative procedure application on data provides a clear categorization, patterns, relation and connectivity of data and derive much more accurate and deep understanding of data which would in turn help in coming up with strategies and plans that would aid in the business growth of the organization.

Almost all organizations irrespective of their type of service and business have developed their own mobile applications, in order to make their service more portable for their customers. The booming of various mobile applications indicates that service for users is just one click away. Almost every individual owns at least one smart phone so every organization has a significant portion of their customers through mobile application. Various studies show that maximum profit for an organization is obtained from its existing customers rather than new customers therefore user retention of mobile application is very important for every organization.

This paper presents a survey of various approaches, methods and algorithms used for analysis of mobile application users with respect to different datasets. The progressive path laid by the paper begins with understanding the customer data , Analyzing their behavior , Segmenting the users , Featuring Markov Models , with the various approaches along with their drawbacks and advantages which all provide more insight to understand the behavior of the users in order to retain the users by improving the features of the application which lead to the uninstall of the application.

Globally, the mobile app uninstall rate after 30 days is 28%. 21% of users now abandon an app after one use. Decision makers and business analysts emphasize that attaining new customers is costlier than retaining the existing ones. So there is a compulsion to retain every single customer. Companies take up this challenge more seriously as every single Mobile App customer is 1000 times more valuable than website visitors as they have installed their Mobile Application.

## II. RELATED WORKS

### A. *K-MEANS CLUSTERING ALGORITHM*

The churn prediction for mobile application user in states that the K-means clustering algorithm gave the highest performance with respect to validity criteria. Two main

# Detection Of Illegitimate Credit Card Transactions Using Machine Learning

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***Abstract:*** **In the present time, online installment framework and net banking are broadly acknowledged everywhere throughout the world as they make the exchanges a lot simpler and quicker. Visa exchanges are quickly expanding throughout the years that lead to a higher pace of online fraud and resulting misfortunes by banks just as purchasers. Lawbreakers can utilize a few innovations, for example, Trojan or Phishing to take the data of others' credit cards. Existing systems recognize even the legitimate transactions as fake ones. Hence a successful strategy to recognize fake exchanges is significant. Right now we give the answer for this issue by Machine Learning and with the assistance of calculations, for example, SMOTE and Random Forest. To test this model a few assessment parameters, for example, AUPRC, AUROC, precision score, recall score and F1 score are determined. The accuracy score of this model is 99%.**

## I. INTRODUCTION

In the present time, online installment framework and net banking are broadly acknowledged everywhere throughout the world as they make the exchanges a lot simpler and quicker. Credit card exchanges are quickly expanding throughout the years that lead to a higher pace of online data fraud and ensuing misfortunes by banks just as shoppers. Hoodlums can utilize a few innovations, for example, Trojan or Phishing to take the data of others' charge cards. Run of the mill association loses about 5% of its income because of misrepresentation exchanges. There are different models which are utilized for distinguishing the misrepresentation exchanges dependent on the conduct of the exchanges and these strategies can be delegated two general classes, for example, managed learning and unaided learning calculation. The current framework utilizes neighborhood anomaly factor and disengagement timberland strategies to distinguish the fake exchanges however this delivers an exactness up to 97% as it were. The point of this paper is to improve the precision of finding the fake exchanges.

## II. EXISTING SYSTEM

In the current framework [6], a relative investigation of local outlier factor and isolation forest techniques are given to recognize the false exchanges. This model attempts to get high extortion exchange inclusion at exceptionally low false alert rate and taking care of huge volumes of exchanges, henceforth giving a technique to identify credit card cheats and giving outcomes in less time. Utilizing this model clients exchange design is broke down and any deviation from ordinary example is considered as fake exchange. It makes detection handling very easy and tries to eliminate the complexity. The data set for this paper depends on genuine value-based information by a huge European organization and individual subtleties in information are kept classified. Exactness of this model utilizing nearby anomaly factor is 97% and utilizing isolation forest is 76%. The accuracy of the outcomes got from these strategies are less when compared with the proposed framework.

## III. LITERATURE SURVEY

The paper [1] utilizes a developmental Simulated Annealing calculation to prepare the Neural Networks for Credit Card extortion identification in real-time scenario. Artificial Neural system is utilized in this paper to distinguish the sort of exchanges and the upsides of doing so are likely gainful for the associations and for singular clients regarding cost and time productivity. Hyperbolic tangent activation curve is utilized to discover the similarities. The drawback of this is a few lawful clients are misclassified as fake clients.

# A Study On Encryption Techniques To Achieve Decentralised Privacy Using Blockchain

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***Abstract*- Data is by far one of the most important assets in the world. However,it should be secured in an effective manner. Data protection is essential for companies as well as consumers. Block chain plays a vital role by providing the security. It is not only secured, reliable but also transparent which makes it even more essential to companies. Therefore we propose a decentralized data management system that ensures users to own and control their data. It ensures that the data is encrypted, which means that modification in data is a difficult task.**

***Keywords*–Encryption; Decentralize; Data security;privacy; Authentication.**

## I. INTRODUCTION

Data security is the process of securing the data and shielding it from unauthorized and corrupted access. Not all data might be sensitive, some data might be private and precious. When access to such data is enabled to an unauthorized user it might create problems as it can be used by people who are not granted access to it. Data security is the measure which is taken to prevent the loss of data through these unauthorized accesses. There are numerous ways to protect data, and some of them include strong user authentication, encryption, data erasure, backup etc. Anyone who is running a business would understand how data can be considered as an benefit. Marketing and financial plans of the company cannot be shared with anybody as competitors may use it, and this might bring loss to your business. Client information are quite sensitive, and it is necessary to ensure that they are kept confidential.

We propose an approach, such that the transactions that take place are transparent. The individuals who are provided access can view the transaction. The Uploaded file is encrypted and stored in blocks. The Encrypted keys are stored in separate blocks.The cipher text is stored in separate block.The algorithms used for encryptions are AES(Advanced Encryption Standard),SHA and Block chain hash function.Finally On receiving requestfrom an authenticated user to access a file an email is sent to acknowledge the request. On accepting the request the decryption keys are generated for three levels and the plain text is recovered.

## II. PRIVACY PROBLEM

Throughout this work we tackle with the privacy issues users face when using third-party services Data privacy is provided to data by handling it based on its relative importance. The amount of data in our world is rapidly increasing. According to a recent report [14], it is estimated that 20% of the world's data has been collected in the past couple of years. Facebook, the leading online social-network, collected 300 petabytes of personal data since its inception [1] a hundred times the amount the Library of Congress has collected in over 200 years [9]. While we all harvest the benefits of a data-driven society, thereis a growing public concern about user privacy. Centralized organizations – both public and private, amass large amount of individual and sensitive information. Individuals have little or no control over the data that is stored about them and how itis used.

Data Ownership- Our proposed system concentrates on ensuring that users own and control their personal data. As such, the system recognizes the users as the owners of the data and the servicesas guests with delegated permissions.

Data Transparency and Audit ability is achievable since each user hascomplete transparency over what data is being collected about her and how they are accessed.

# Optimization Technique For Front-End In Website Development

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***Abstract*— To improve page utilization and user interaction experience webpage capacity becomes bigger and bigger and use a lot of java script code and its framework technology in webpages which makes webpages more expressive and richer. It also affects the resolution efficiency of the webpage in the browser and directly delays the loading time of the webpage. To improve the user experience web optimization becomes extremely necessary. Website optimization is divided into front-end optimization and backend optimization front-end optimization requires less time resources and modifying a small number of programs can quickly improve the speed of your site. Although the total effect of the optimization depends on the specific web page the appliance of these rules does not only reduce the page loading speed but it also affect the total bandwidth and load of the webserver.***

***Keywords*— front-end, optimization, response time, web performance ,page loading.***

## I. INTRODUCTION

A crucial part of web automation technologies is the ability to execute automatic web navigation sequences. An automatic web navigation sequence consists in a sequence of steps representing the actions to be performed by a human user over a web browser to reach a target web page. Front-end optimization (FEO) is the process of optimizing the delivery of website resources from the client side. In IT, there are two different areas where technology works: the client side, or front end, and the server side, or back end. FEO reduces the number of page resources needed to download a given page, allowing the browser to process the page more quickly. Best practices in FEO include methods such as resource consolidation, versioning, domain sharing, diminish and use of compression. New technologies are also emerging that automatically optimize Web pages. Front-end optimization uses several processes to streamline Web page HTML code and resources, making it easier for a Web browser to load.

In the further paper we will have section II as motivation of the project .A brief understanding of survey in section III. Drawbacks in previous model and our Proposed system has been discussed in Section IV. Solution of the project is discussed in section V. System Architecture is shown in section VI. The Status Outcome will be viewed in Section VII. Towards the end, the conclusion is discussed in Section VIII.

## II. MOTIVATION

User on slow connection with the website may get frustrated, Waiting longer may be expected to redirect them from one to other. User optimization refers to creating a memorable user experience, so that they'll read your content and take the right actions. Optimizing your content for users will increase conversion rates and boost your search rankings, both of which are crucial for business success. Website optimization involves improving the aspects of your website that contribute to traffic and conversions. Website optimization can also be connected to improving the speed and reliability of a website's performance. This is implicitly relevant to the goal of website optimization as the completion of a desired action on a website. Poor website performance, such as

# Signature Substantiation to Prevent Falsification

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*Abstract*— **In recent times, online transactions are challenging due to skilled forgeries. This challenge can be aggravated when there comes small labeled training datasets available with large intra-personal variations. In this we use Active learning which is a powerful form of supervised machine learning characterized by interaction between the learning algorithm and data source during the learning process. It helps to obtain new outputs at different data points. We also propose SVM based active learning to separate genuine signatures from forgeries. We are implementing Multimodal based user verification system as a modification. Neural networks and back propagation algorithm is used. The signature is entered using mouse. Only after successful authentication of signature verification, user will be login into their account.**

***Keywords—signature verification, active learning, transfer learning, signature training, back propagation algorithm.***

## I. INTRODUCTION

Signature is the most common biometric characteristics used for verification these days. Offline Signature Verification (OSV) system targets to separate the image of genuine signature from the skilled forgeries. OSV is one of the challenging tasks in pattern. Moreover, it is not convenient to gather a large number of signatures from each person; therefore, small training size and also small labeled data make OSV an even more challenging task [11]. However the signatures of an individual can be very different from each other. A large number of security issues occur in recent times for transacting money through signatures. Many number or forgeries happen in signing a document. Also, several measures have been taken to resolve such problems. But not all have reached success. A verification to find the authorized person is approached in this paper.

The objective is to authenticate the bank transaction through the mouse signature. Multimodal based user verification system is proposed. Neural network & Back Propagation Algorithm can be used for signature Verification. A scientific study of algorithms and statistical models that computer systems use to perform a specific task is approached. K nearest neighbour algorithm makes a compilation to find the nearest points in the signature for verifying that the user is authorized. The method of using mouse for signature is proposed. Mouse is used as the device as it is cost efficient. The signature of the user is only known to the particular user. A training phase is set up through Machine Learning algorithms. The usage of dataset is considered through Active and Transfer learning. The scope is to implement a complete security for the online transaction using mouse signature.

The rest of the paper is organized as follows: The related works are reviewed in section 2. Section 3 comprises the motivation to work on this sector. In section 4, we present our proposed methodology for signature substantiation. The experimental results are provided in section 5. In section 6, the future scope beyond are works is discussed. We finally discuss and conclude the results and suggest future research directions in the last section.

## II. LITERATURE REVIEW

There are various schemes used for offline signature verification. One of the methods used is learning the representations from signature images, in a Writer-Independent format, using Convolutional Neural Networks[1]. This method follows a novel formulation of the problem including knowledge of skilled forgeries from a subset of users in the feature learning process. This aims to capture visual cues which distinguish genuine signatures and forgeries regardless of the user. This way of learning features in a writer independent way can be effective for signature verification, improving performance on the task , compared to the methods that rely on hand-engineered features. But the observations of this model showed that the model learned with forgeries in GPDS dataset did not perform better in all cases such that the characteristics of forgeries in the datasets may be different.

International Journal of Psychosocial Rehabilitation, Vol. 24, Issue 08, 2020
ISSN: 1475-7192

# A study on deep ocean image processing for object detection using pattern recognition

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***Abstract***— *Deep ocean imaging and image processing techniques play a vital role in ocean engineering and scientific research. However, the underwater images usually suffer from low contrast, blurring, color fading, noise, and other distortions, due to these factors the identification of objects in the underwater image becomes difficult. In this work, we propose a multi-tiered underwater image processing system by incorporating various image enhancements, restoration and edge detection algorithms. The implementation of these mechanisms enhances the image quality by removing distortions and further this enhanced image is used to obtain patterns with which presence of various underwater species and objects can be analyzed.*

***Keywords***— *Underwater Image Processing, Image Enhancement, Image Restoration, Pattern Recognition, Edge Based Matching*

## I INTRODUCTION

Submerged image processing is of paramount importance due to the growing demand for naval resources in various applications such as sea bed topography research, monitoring sea life, assessing geological and biological environment. It is a challenging task due to various perturbations present in the water. The light is exponentially attenuated due to scattering and absorption, thus the resultant images poorly contrasted and hazy. The scattering of light is subdivided between forward dispersion and backward dispersion. When the pictures stretch out, the clarity is low and the intensity is diminished by backward dispersion. We need to research the distribution of light in water in order to get underwater pictures of decent accuracy. As light passes through vapor, based on the wavelength of colour, the rate of light loses exponentially. Because the elements are last removed, much of the photos captured under the surface appear blue-green. These limitations influence the overall performance of underwater imaging systems.

We propose an approach, integrating various image enhancement, image restoration and edge detection algorithms to overcome the limitations prevalent in underwater images and further identify underwater objects. Image enhancement is initially carried out by increasing the intensity levels of the image or parts of the image so that the resultant image is of good quality compared to the captured images. The Contrast Limited Adaptive Histogram Equalization (CLAHE) is the enhancement algorithm used here. It prevents the over amplification of

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**Received: 27 Mar 2020 | Revised: 20 Apr 2020 | Accepted: 05 May 2020**

VDGOOD Technology Factory

VDGOOD Journal of Computer Science Engineering

# Conversational Companion for Mental Health Support Using Tensorflow

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**VDGOOD use only:** Received 14-Mar-2020; revised 30-Mar-2020; accepted 20-Apr-2020

**Abstract**

Depression and stress management have become inevitable buzz words in our hassle bound lives. According to World Health Organization, around 300 million people have been suffering from depression alone. Though counselling and psychiatric support groups are available, not everyone can afford to reap their benefits. As technology is reaching new heights every day, armed with Artificial Intelligence and Machine Learning, everything seems solvable and providing emotional assistance is no exception. Chatbots are becoming popular and gaining traction in almost every field due to its efficient and intelligent user interaction. This conversational service is powered with Natural Language Understanding (NLU) and the VOICE recognition works on the principle of Multi Nominal Naive Bayes Algorithm that captures the user's voice using mike and converts into text.The chatbots response is refined by using training sets so as to make the user feel as if he is talking to a real person and not to a machine. This automation is accentuated with features such as sad or depressed or just feeling low. The subtle aim of the chatbot is to provide an adaptive and friendly platform for people seeking personal emotional assistance with less complexity and customizable features that continuously sharpens its emotional characters. 

*Keywords:* Difflab Match Sequence; Logic Adapters; Ratcliff And Obershelp Algorithm; Seq2seq Model In Tensorflow; Tensorflow;

## 1. Introduction

As technology is reaching new heights, a lot of research has been initiated to detect human emotion and bridge the gap between human and machine interaction. Our lifestyle seems to have evolved with automation but new buzz words like depression, stress and emotional breakdown have become inevitable. Though psychology helplines and other facilities are available to assist people, not many can avail those

International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 08 | Aug 2020 www.irjet.net p-ISSN: 2395-0072

National Conference on Recent Advancements in Communication, Electronics and Signal Processing-RACES'20
Organised by: Department of ECE, Velammal Engineering College, Chennai-66

# RAILWAY COLLISION AVOIDANCE SYSTEM USING PATTERN RECOGNITION AND OBJECT DETECTION

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***Abstract*** **–**In our country accidents at rail road crossings are increasing day by day and the train accidents cause severe damage to life and property. These accidents take place mainly due to human negligence, equipment failure, derailments etc. To solve these problems and to save lives unnecessarily lost we have come up with a solution of automatic railway collision avoidance system using pattern recognition and object detection algorithms. Pattern recognition algorithm developed is used for recognizing different patterns of the train and object detection algorithm is used for giving an alert to the driver about any object that is stuck on the track. Many scholars have already identified various solutions regarding this problem. But they were deficient in deriving mechanisms that predict whether the arriving object is train or not. This in turn produces wastage of energy. Also they were unsuccessful in achieving accuracy for object detection algorithms. Our proposed solution overcomes these drawbacks using pattern recognition, object detection and live video streaming using IOT modules to produce best results to the problem of accidents faced.

***Keywords*** **– Pattern recognition, IOT, Object detection, railroad crossings, sensors, IR camera, Central server.**

## 1. INTRODUCTION

Accidents at level crossings is the most critical problem faced by many countries. If these crossings are automated then the rate of accidents occurring in these areas can be reduced. But designing this system involves many challenges. Many researches have proposed a solution for our problem but that solution includes various drawbacks. They have not devised any mechanisms that predict whether the coming object is train or not. This produces of wastage of energy. Also they have designed systems that does not help or save any object like an animal, a vehicle that is stuck on the track.

Our proposed system overcomes all these drawbacks and also provides an efficient solution to all railroad accidents. Our system also uses similar components like sensors, arduino board, motor receiver etc. Additionally we have fixed a camera near the gate for image processing techniques. We have developed a pattern recognition algorithm to recognize patterns of different trains with different speeds. Only if arduino recognizes the pattern of the train in the arrival object then gates close at the level crossing. Also we have designed an object detection algorithm to inform trains passing through that route about the obstacle that is stuck on the track. A live video of object that is stuck is streamed on driver's mobile using port and socket programming of IOT. Then the driver takes decision considering the lives of passengers present inside the train.

The overview of our paper is as follows: Section II deals with literature reviews. This part shows solutions proposed by many authors to our problem. Section III presents the methodologies used by us to bring an efficient solution. This section also gives a detailed description of algorithms used, block diagram, UML diagram and many more. Section IV deals with results and discussion of our system. This section involves comparison, performance and evaluation measures. Section V concludes our paper. Section VI acknowledges our project and tells about who and all encouraged us to do this project. The last section presents you with the list

# Optimum Data Compression using Machine Learning Algorithms

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***Abstract:*** **Compression is widely used to shrink the amount of data being transmitted. Various compression algorithms are present for different types of media including text, images, videos, documents etc. However, different algorithms work with different compression rates that differ according to the data available. This results in inconsistencies in the results of the compression. This paper aims to fix this inconsistency by finding the optimum compression rate for all data types using multinomial Naïve Bayes algorithm and natural language processing. The system is trained on different data sets and this is used to predict the algorithm that gives the best compression rate. This will enable the system to choose the algorithm with the best compression rate regardless of the input data. The test data is given in the form of a CSV file and the compression ratio improves with the amount of data sets the system uses for training. CSV files are widely used due to its simple structure and ease of creation. The use of optimum compression will result in lesser amount of data being sent and received over the internet thereby reducing costs. This works for all formats of files and the data is trained accordingly. The simulation results show precision values of around 90% for a few random input files.**

***Keywords – compression; Naïve bayes; CSV; Natural Language processing.***

## I. INTRODUCTION

Data compression is the process of encoding/storing the data in a smaller number of bits when compared to its original value.[1] There are two types of compression: lossy and lossless. Lossless compression involves reducing the number of bits by eliminating statistical redundancy. As the name suggests, there is no loss in data in this method. On the other hand, a lossy compressor removes bits that is not absolutely essential to the main data thereby leading to some loss in information. Any device that compresses data is called an encoder and a device that performs the opposite is called a decoder.[2]

Generally, data compression refers to reducing the size of a file for some purpose. It is the process that occurs at the source before transmission or storage. Hence it is also referred to as source coding.[3] It takes more time to compress and transmit or store data when compared to directly transmitting or storing it. In essence, data compression is basically a trade-off between space and time. Resources consumed for storage gets reduced but the computational cost increases. For example, a real time video compressor/decompressor may need some expensive hardware to perform decompression so as to avoid any glitches or lags. Many factors play a role in this trade off including computational resources spent, degree of distortion introduced and the compression ratio (higher the ratio, more the resources needed to decompress).[4][5]

Data compression and machine learning have always been closely related. Arithmetic coding involves the use of machine learning to predict the following sequence of characters using previous sequences and machine learning makes use of optimal compression by choosing the best compression technique given its previous results.[6][7]

## II. OVERVIEW

The study/ use of algorithms and statistical models to make a system perform certain tasks without explicitly programming them to do is called machine They are a subset of AI and involve using certain mathematical models and previous data(also known as training sets) to predict and make decisions without explicit programming..[8] ML algorithms are used in situations where it is computationally infeasible to write explicit programs for functionality. It is also used in situations where human behaviour must be mimicked.

Mathematical Optimization is the process of choosing the best out of a given set of possibilities/alternatives.[9] Optimization is present in all domains where the results are based on quantitative factors including but not limited to computer science and engineering and the process of finding such an optimal solution has always been the goal of mathematicians.[10] Basically, an optimization problem involves finding the minimum or maximum value from a given set of values according to the situation demand. It includes finding the best result or the best value from the available values. Machine learning is used in optimization frequently as optimization generally involve either maximizing or minimizing resource availability and resource use respectively. The difference between the two is that while optimization deals with minimizing or maximizing values for a given set of input or data, machine learning focuses on minimizing or maximizing future input given current input and their optimization.

International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 08 | Aug 2020 www.irjet.net p-ISSN: 2395-0072
National Conference on Recent Advancements in Communication, Electronics and Signal Processing-RACES'20
Organised by: Department of ECE, Velammal Engineering College, Chennai-66

# KIDS' SMARTPHONE ACTIVITIES TRACKER: AN ANDROID APPLICATION FOR TRACKING AND MONITORING CHILDREN SMARTPHONES

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***ABSTRACT*** — Smart phones with unlimited applications are considered essential for contemporary day lifestyle, hence the amount of smart phone users has sky rocketed during this decade. The high percentage of youngsters and teenagers carrying cell phones has caused controversy on how justified having a minor carrying a communication device is. There is little question about the very fact that oldsters need to be ready to contact their children, however, a toddler with a phone and poor judgment will most likely be vulnerable to the outer world with all its' threats and abuses. And also they are privy to a lot of information from web that might or might not be age appropriate. It is becoming very difficult to track, monitor and limit the children's mobile usages and the content they view. Controlling, monitoring, and managing approaches are in got to help in overcoming a number of these worries.

The proposed alternatives included phones with an android application that allows parents to monitor their children smart phone activities. The proposed system "kids' tracker" includes an Android application on the parents' smart phone. Kids' tracker has shown a really decent performance with many unique features compared to other existing solutions.

**Keywords— GPS Tracking, Telephony Services, Android Operating System, Smart Phones.**

## INTRODUCTION

The term Location-Based Service (LBS) may be a concept the term Location-Based Service (LBS) could also be an idea that denotes applications integrating geographic location (i.e., spatial coordinates) with the general notion of services. Samples of such applications include emergency services, car navigation system, tourist tour planning, or "maps" information delivery. This application is typically to be used by parents to trace down the child's location. Currently, there are about 1.5 million android devices are activated in a day and quite 50 billion apps are downloaded from Google play in monthly .This indicates the widespread acceptance and usage of mobile device like android devices among users. There are more and more mobile applications developed on Android OS. This is often actually because android is that the most environment that mixes the next features: a really open, free development platform supported Linux and open-source. In this paper, the proposed App named Kids' Tracker android application is additionally supported location-based service. The basic needs for this app are: First, Child's and Parent's mobile should be on and thus the App should be installed and Second, GPS should be enabled.

Nowadays, all smart phones are provided GPS technology which provides the spatial coordinates of the user location with the help of worldwide Positioning System (GPS); satellites data with support from cellular network and it works both indoor and outdoor, responds faster, and uses less battery power.

## ARCHITECTURE OF MOBILE LBS

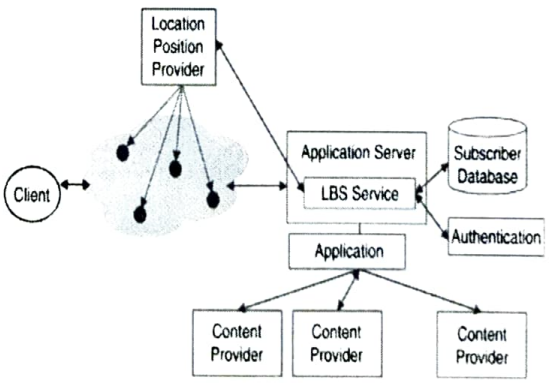


**Figure 1**

# Crop Yield and Crop Cost Prediction by Comparing Measurements using Machine Learning Method

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*Abstract*— **Among worldwide, agriculture has the major responsibility for improving the economic contribution of the nation. However, still the most agricultural fields are under developed due to the lack of deployment of ecosystem control technologies. Due to these problems, the crop production is not improved which affects the agriculture economy. Hence a development of agricultural productivity is enhanced based on the plant yield prediction. To prevent this problem, Agricultural sectors have to predict the crop from given dataset using machine learning techniques. The analysis of dataset by supervised machine learning technique(SMLT) to capture several information's like variable identification, uni-variate analysis, bi-variate and multi-variate analysis, missing value treatments etc. A comparative study between machine learning algorithms had been carried out in order to determine which algorithm is the most accurate in predicting the best crop. The results show that the effectiveness of the proposed machine learning algorithm technique can be compared with best accuracy with precision, recall, F1 Score, Sensitivity, Specificity.**

***Keywords***— ***Datasets, Machine learning-Classification method.***

## I. INTRODUCTION

In developing countries, farming is considered as the major source of revenue for many people. In modern years, the agricultural growth is engaged by several innovations, environments, techniques and civilizations. In addition, the utilization of information technology may change the condition of decision making techniques related to the agriculture are used. Data mining is a process of extracting the most significant and useful information from the huge amount of datasets. Nowadays, we used machine learning approach with developed in crop or plant yield prediction since agriculture has different data like soil data, crop data, and weather data. Plant growth prediction is proposed for monitoring the plant yield effectively through the machine learning techniques.

The scope of this paper is to investigate a dataset of agricultural department records using classification machine learning algorithms and to predict the crop yield and crop cost. It is also applicable for the automated process of farming is the beginning of a new era in Bangladesh that will be suitable for the farmers who seek experts to take suggestion about the appropriate crop on specific location of their land and don't want to forget any step of the cultivation
throughout the process. Although, the opinion from the experts is the most convenient way, this application is designed to give accurate solution in fastest manner possible. This research's main objective is to bring farming process a step closer to the digital platform.

## II. LITERATURE REVIEW

Field crop yield precision is crucial to grain storage, agricultural field management, and national agricultural decision-making. Currently, crop models are widely used for crop yield prediction. However, they are hampered by the uncertainity or similarity of input parameters when extrapolated to field scale. Data assimilation methods that combine crop models and remote sensing are the most effective methods for field yield estimation. In this study, the World Food Studies(WOFOST) model is used to simulate the growing process of spring maize. Common assimilation methods face some difficulties due to the scarce, constant, or similar nature of the input parameters. For example, yield spatial heterogeneity simulation, coexistence of common assimilation methods and the nutrient module, and time cost are relatively important limiting factors. To address the yield simulation problems at field scale, a simple yet effective method with fast algorithms is presented for assimilating the time-series HJ-1 A/B data into the WOFOST model in order to improve the spring maize yield simulation. First, the WOSOFT model is calibrated and validated to obtain the precise mean yield. Second, the time-series leaf area index(LAI) is calculated from the HJ data using an empirical regression model. Third, some fast algorithms are developed to complete assimilation. Finally, several experiments are conducted in a large farmland to evaluate the yield simulation results.

Machine learning, which is an efficient empirical method for classification and prediction, is another approach to crop yield estimation. It described the corn yield estimation in

# *A Multi-level Security System for Larceny Intimation using Internet of Things(IOT)*

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***Abstract*—First and foremost, iotare Smart, connected appliances. An intelligent house is programmed to save energy and make your life a more convenient one: Alarm clocks will be synced with traffic apps , heating systems will be synced with external temperature sensors, which will be synced with cost evaluations; lighting will react as we enter a room, as might our coffee makers. There are plenty such homes that already exist. There are various fields were iot has placed its strong firm in the phase of time. This paper deals with the technological advancements in the phase of (iot) internet of things in the field of security. The demand for iot has become more and more reliable in the development of security. As security plays a vital role in abolishing data breach,its very much mandatory to safe guard once's information .Therefore this project helps in the multilevel security enhancement which accounts 3-tier authentication of information that includes biometrics, number lock, hand held devices.**

***Index Terms*—*Internet of Things, Lock system, Raspberry pi, Arduinouno, servo motors, Authentication, Security.***

## I. INTRODUCTION

The evolution of internet in 1969 enabled people to communicate through messages by exchanging content and providing information. Consequent breakthrough of Internet had set forth the advancements in the field of "Internet of Things"(IoT). The Internet of Things refers to the billions of physical devices around the world that are connected to the internet for fetching and distributing information. They can accumulate data, disclose and make decisions with or without human interactions. The Internet of Things is making the fabric of the world around us smarter and more responsive, merging the digital and physical universes. IoT has excessive possibility to control our environment and consequently affect our lives.

Security is one the substantial issues with IoT. These sensors are collecting extremely sensitive data -- what you say and do in your own home, for example. Holding information securely is vital to trust of the customer, but so far the IoT's security track record is extremely poor. Many IoT devices contributed limited fortification to the basic means of security, like encrypting data in transit and at rest. Many IoT devices lack the ability to be patched, which means they are permanently at risk. Hackers are now actively targeting IoT devices such as routers and webcams because of their inherent lack of security makes them easy to snitch. In this perspective, an increasing number of household devices (e.g., door-locks smoke-alarms, cameras,.and light-bulbs) equipped with networking capabilities are allowing people to collect selected real-time data about their homes and act accordingly. Although these devices are getting widely used, security-related concerns are still being faced . These shortcomings are particularly resulting from the vulnerability of IoT devices to a large number of attacks. It was indeed, reported in the literature that IoT devices were(for example, used as bots to launch DDoS attacks or spams). Countermeasures to attacks are especially difficult because of the commonly limited software and hardware capabilities of devices as well as their proprietary technologies. The Government is worried about the risks in the security, they expect the devices to have unique passwords, that companies will provide a public point of contact so anyone can report a vulnerability (and that these will be acted on), and that manufacturers will explicitly state how long devices will get security updates. It's a modest list, but a start.

An IoT-based security riposte is, therefore, needed to prevent malicious nodes from instigating attacks and compromising the activities of the IoT devices. However, a single security level is not secure enough and are suspected to number of attack such as dictionary attack, brute force attack, shoulder surfing attack, etc. An approach was made through this paper towards providing a more reliable and complete solution for implementing multi-level authentication in a lock system.

In this paper, we proposed a new secure, private, and lightweight multi-level security system for intruder intimation. This method integrates the system into three level authentication system involves a number lock, hand-held device authentication and a bio-metric authentication and tests users against different authentication methods for each level. Moreover, our contribution includes the use of mobile phone to shorten the authentication process while offering the possibility to identify malevolent nodes.

In the remainder of this paper, the second module explains about the related works and the succeeding section deals with

# Automated quality inspection of manufactured components using image feature extraction

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***Abstract*— *Maintaining quality standards is important in the manufacturing sector. Zero defect is a key factor in achieving manufacturing excellence. Deskilling is a major step in any manufacturing process to achieve zero defect. Traditionally quality gates are created for this and these gates are controlled by skilled inspectors. Fatigue becomes a point of concern which leads to gate failure. The system introduced here aims to deskill the activity and remove inspector dependency thereby trying to achieve zero defect. The aim of the project is to compare images of a manufactured component with a standardized Computer-Aided Design (CAD drawing) in Data Exchange Format (.dxf file) and identify any deviation in the dimensions of features of the component presented in the image from that of the CAD drawing.***

## I. INTRODUCTION

In manufacturing industries, machining defects are anomalies in dimensions or surface that occur when the raw material is cut and processed to obtain a particular shape and structure. Defects may include several factors like dimensions of components, structural defects, painting defects etc. Our system focuses on identifying dimensional defects of the components. In order to detect the dimensional defects in such large components, a study has been conducted to find suitable solutions involving digital image processing. The proposition here is to capture images of each component in sections, stitch the images of all the sections into one and extract features from it using computer vision feature extraction algorithms. 'Features' include number and size of drill holes, slots and other similar entities. It is required to automate the existing process of manual inspection effectively to save time and cost. The features are compared with a standardized Computer Aided Design blueprint of the parts in Data Exchange Format (.dxf). The results of the inspection are generated as a report.

The first part of the paper gives a survey of literature and the existing system followed by the image processing techniques used in the current system. Then a step-by-step explanation of the entire process is shown with the help of experimental analysis. This procedure indicates to be much more effective than the current manual inspection process being undertaken.

## II. PREVIOUS WORK

In [1] Alan López , Francisco J. Cuevas introduced a circle-detection method based on a meta-heuristic technique: the teaching learning-based optimization algorithm. The algorithm encodes three points as candidate circles on an edge image. An objective function is used to find the presence of those candidate circles. The mid-point circle algorithm is used to determine the required points of a circle in a digital image. Computation of pixel positions is done only within the first octant by the exploitation of the symmetric nature of the circle. Hence a significant reduction of computational burden is seen. Accurate detection in the presence of noise is attributed to the TLBO algorithm. To enhance the search space of the TLBO algorithm, the image is preprocessed.

In [2] E. Cuevas et al proposed a circle detection algorithm based on Learning Automata (LA) which explores an unknown random environment by progressively improving the performance via a reinforcement signal (objective function). Three non-collinear points are encoded as a candidate circle over an edge image. A matching function called the reinforcement signal indicates if such candidate circles are present in the edge map. Guided by the values of such reinforcement signals, the probability set of the encoded candidate circles is modified through the LA algorithm so that they can fit onto the actual circles on the edge map.

Three advances are described in [3]. First, a new heuristic is described for feature detection using machine learning, which improves the efficiency and generality of the algorithm. The derived feature detector has the capability of fully processing live Phase Alternate Line (PAL) video using less than 5 percent of the available processing time. By comparison, most other detectors cannot operate at such frame rates. Second, the detector is allowed to be optimized for repeatability with little loss of efficiency. A feature is said to be "repeated" if it is also detected near the same real-world point in several images. This heuristic detector significantly outperforms existing feature detectors. Third, a rigorous comparison of corner detectors based on the above repeatability criterion is carried out and applied to 3D scenes. The main advantage of features from the accelerated segmented test is that they provide better repeatability results i.e. the results are the same when taken from different angles. The high computational efficiency of the algorithm provides it with an edge over the others although a lot of training samples are required.

# DEEP LEANRING IN ULTRASOUND IMAGE ANALYSIS-A SURVEY

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*Abstract*—**Ultrasound imaging is being used in many industrial fields today apart from its extensive use in the medical field.Compared to CT and MRI it has an advantage of shorter acqusiton time and smaller doses of radiation.The fact that it uses sound waves makes it a harmless and cheaper technique. It is mainly used for analysis of things that cannot be accessed or viewed directly. It also gives realtime images. Sometimes the characteristics of the images obtained like low resolution, noise do not lead to an effective analysis. To make an effective analysis and better feature detection deep learning is being incorporated.Use of neural networks has also helped in giving faster results.In this paper we present a survey on the deep learning techniques that have been developed for different ultrasound analysis applications over the years**

***Keywords-Deep learning ,Ultrasound,image analysis,neural network,***

## I. INTRODUCTION

Ultrasound is sound waves with frequencies over the upper audible limit of human hearing. In ultrasound imaging a transducer is placed on the surface of whatever is being tested. The images are produced based on the reflection of the waves off from the structures present in the object that is being tested.The strength of the sound signal and the time taken to travel through the object provide the information necessary to produce an image. The number of probes used depends on the application in which its being used.Conventional ultrasound gives 2D images .The latest advancements in ultrasound technology include three dimensional (3-D) ultrasound that formats the sound waves into 3-D image data.Medical ultrasound is being widely used spanning from fetus detection, obstetrics to cardiology and oncology.It also has many industrial applications like undersea applications and the newly emerging ones are ultrasonic sensors in autonomous vehicles and ultrasound based surgery etc.It is highly cost effective offering the user a high level of interaction.

US technology is fast evolving with increasing advantages.The ultrasound probes are increasingly becoming compact but certain challenges like low imaging quality and variability are still present.From the image analysis perspective there is a need to develop automatic image analysis technique to make assessment more accurate and objective.This is where deep learning comes into play.Deep learning is emerging as a reliable machine learning tool in many fields today mainly in image analysis.The use of neural networks has made image analysis much more efficient.Therefore integrating deep learning techniques with US image analysis has a huge potential in overcoming the challenges related to US imaging.

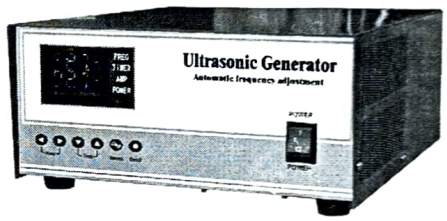


Fig1:Ultrasound generator

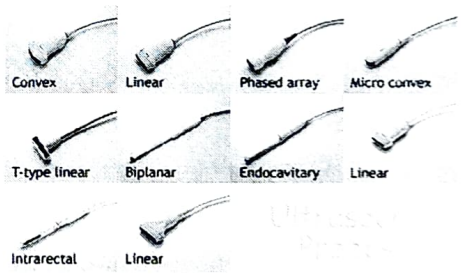


Fig 2:Transducers

In this paper we discuss how deep learning solutions are improving the ultrasound image analysis pipeline.

The rest of the paper is organized as follows:Section II presents the basics of deep learning and the areas where they are applied.Section III discusses the various deep learning architectures that are used in US image analysis.Section IV presents the challenges in US image analysis.Section V presents the different applications of Ultrasound where deep learning and their methodologies.Section VI deals with the concluding remarks of the paper.

## II. AN OVERVIEW ON DEEP LEARNING

Deep learning is a branch of machine learning.It is an approach where learning takes place from examples.Its ability to extract high level abstract features from the input

Proceedings of 5th International Conference in Ocean Engineering (ICOE 2019)

28th July to 1st August 2019

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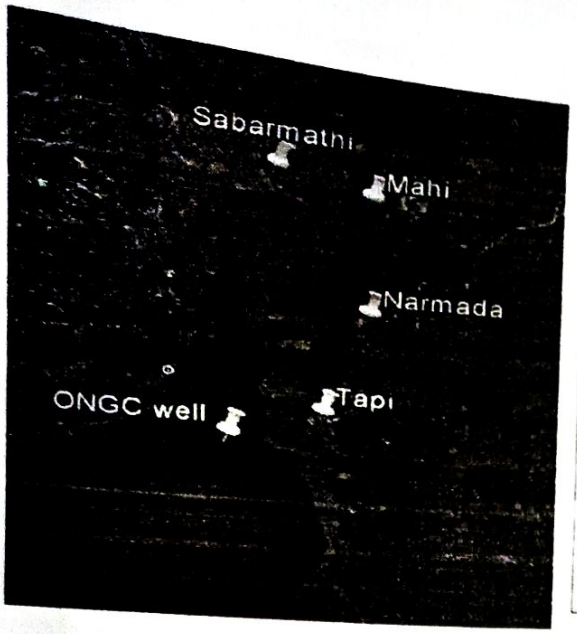
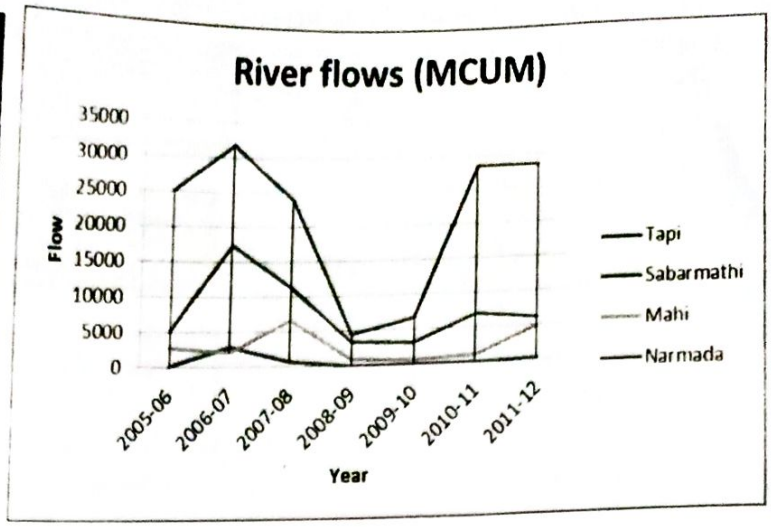



Platform

(a) (b)

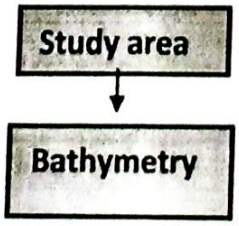
**Figure 1 (a)** Shows the satellite image of rivers near ongc platform (b) shows the Discharge of rivers (Source CWC data)

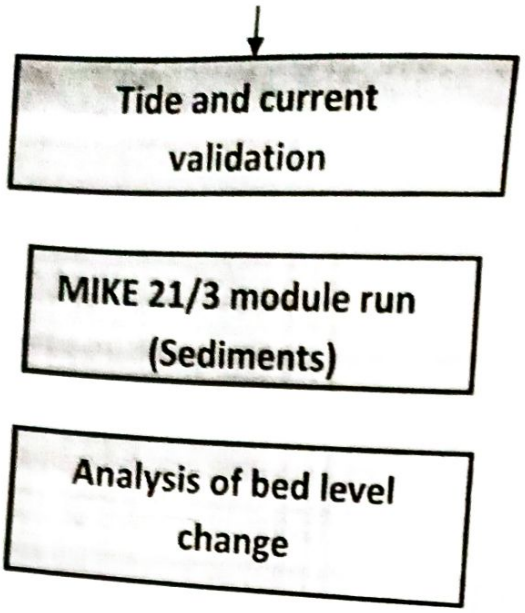
Sediment transportation is a process of sediment movement. Fluid motion leads to the sediment transport in ocean, rivers, lakes, seas and other water bodies due to currents and tides. Knowledge of sediment movement is necessary to understand the causes of deposition or erosion at the sea bed, and the rate at which the erosion or deposition is occurring.

The Gulf of Khambhat is having a geometry of an inverted funnel-shaped indentation on the Arabian Sea of India, covering the state of Gujarat. The maximum water depth of Gulf of Khambhat region is (-)50.00m. Gulf of Khambhat receives enormous sediment from the discharge of three major rivers: Narmada, Tapti and Sabarmati. Considerable amount of shoal movement as well as shoal enhancement has been observed along the rivers. The sea bed and sediments are mainly fine to coarse grained sand.

## METHODOLOGY

The objective is the study of sediment transport pattern due to currents in the gulf region. The numerical model MIKE 21/3 integrated module is adopted. The methodology flowchart is shown below;




Tide and current validation
MIKE 21/3 module run (Sediments)
Analysis of bed level change

generated for a period of one month. The generated data is to be calibrated before using for further analysis. Hence the tide data for the project area was extracted from the domain of Global tide elevation for the generated period of one month. The generated data and extracted data were in fairly good agreement (Figure 7.1). The comparison of the two data sets is furnished in table 2

*Table 2 Tidal condition*

| Tidal condition | Simulated data | Global tide data |
|---|---|---|
| Spring tide (m) | 6 | 6 |
| Neap tide (m) | 3 | 3 |

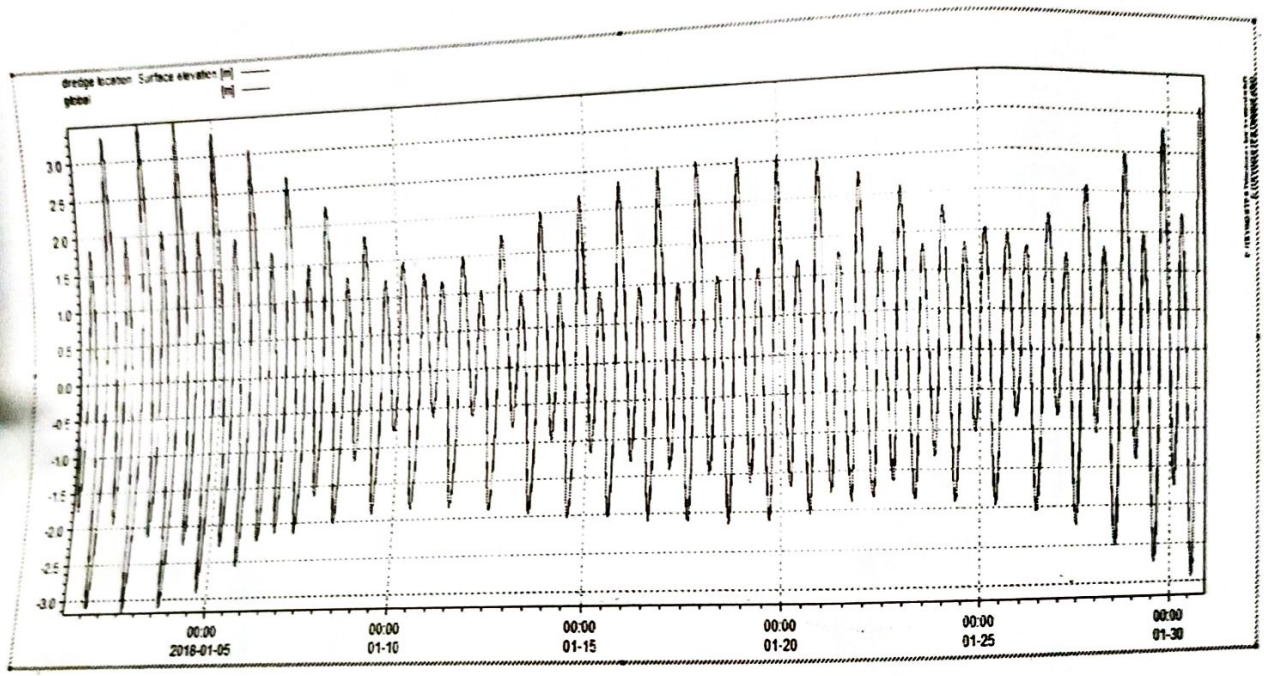



*Figure 3: Time series of water level variation obtained by simulation and global data*

The above graph shows the comparison of global tide elevation and model simulated tidal elevation. This comparison is made for the validation purpose.

## ALIDATION OF CURRENT AT THE LOCATION OF DREDGE LOCATIONPLATFORM BEFORE AND FTER DREDGING

The tidal model run was performed with the calibrated data for the location of the well head- Platform . Initially the first trial was carried out for the present existing condition where the bed level is (-)4.00m. Then the second trial was performed after simulating the dredging condition with the bed level dredged to (-)20.00m. The current values extracted for well -head platform.

*Table 4 Current speed*

| | Before dredging | After dredging |
|---|---|---|
| Maximum current speed(m/s) | 2.6 | 1.3 |
| Minimum current speed(m/s) | 0.7 | 0.4 |

## BATHYMETRY

This involves plotting of sea bed contours. The overall area considered for the siltation analysis is 4 km, relatively less area is considered to get accurate answer. The bathymetry of this overall ar generated using Delft dashboard taking the data from GEBCO (General Bathymetric Chart of the Oce Once this bathymetry is generated the bathymetry of dredging area was superimposed on it and the m was made ready. Flexible mesh type of model was generated.

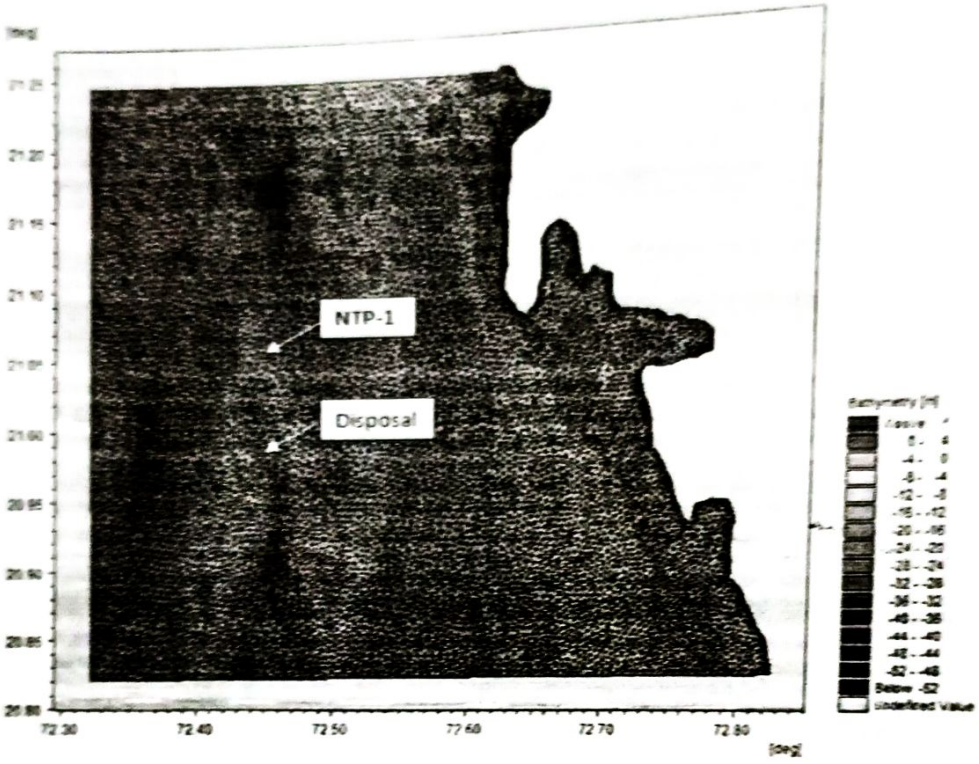



Figure 2 : Shows the Generated bathymetry by incorporating field data.

Using flexible mesh, the model complexity can be reduced by giving different resolution of mesh based on the area of interest. The area away from location can be provided with coarser mesh and the area near to the well-head platform is designed with finer mesh. This flexible meshing helps to reduce the simulat time.

## VALIDATION OF MODEL

- Validation of the surface elevation is done using the global tidal data.
- Validation of current is done using the already existing data obtained from the HD model.

## VALIDATION OF TIDAL PARAMETER

The model was created by incorporating the bathymetry. Before performing the trial runs the model calibration is to be carried out. The tidal data for gulf of Khambhat was generated with the tide generation tool box available with Mike 21. The generation was done based on bathymetry and the spatial position of study area. The tide data was

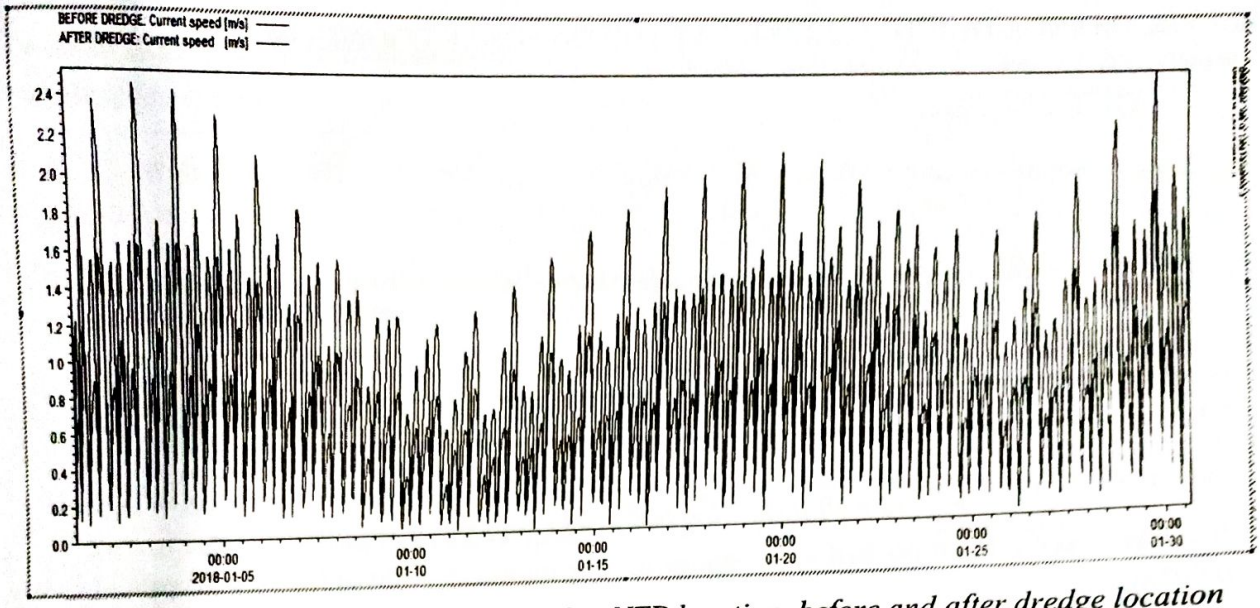



*Figure 4 Time series plot of current speed at NTP location, before and after dredge location*

It can be observed that the current value matches with the previous data obtained in HD module. After calibrating the model with the observed or existing parameters, the model is made ready for further trials.

## RATE OF BED LEVEL CHANGE AT DREDGE LOCATION

The well- head platform is located approximately 24 kilometers from the Tapti river outflow. During the monsoon period the river discharges ample amount of sediment into Gulf of Khambhat through runoff which increases the suspended load and the bed loads of the region. But this sediment content does not contribute to the sediment deposit near well-head platform since the source

The average rate of bed level change in a spring tide (7 days) is 2.3m/year and The average rate of bed level change in a neap tide (7 days) is 0.3m/year.

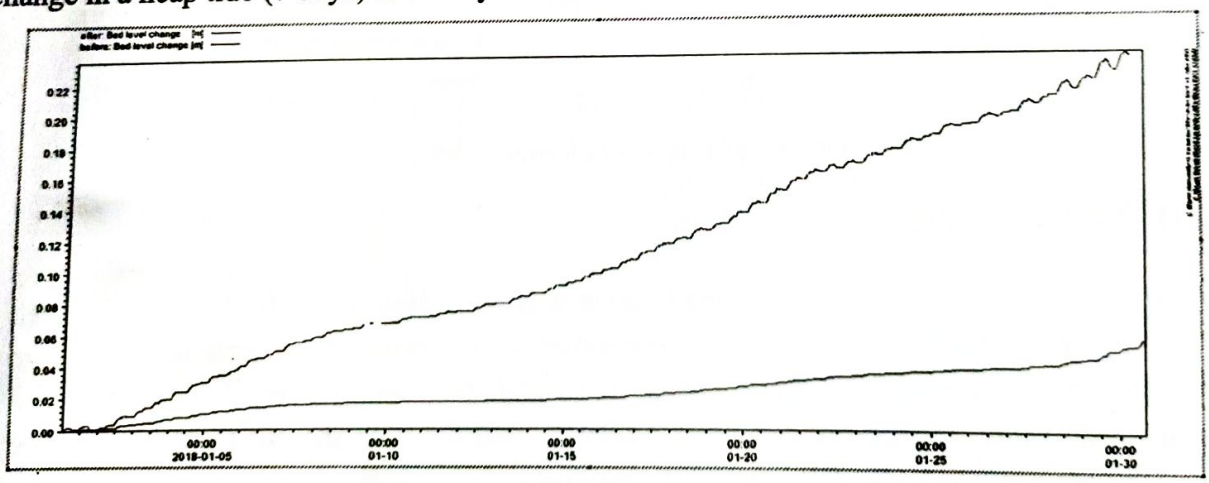
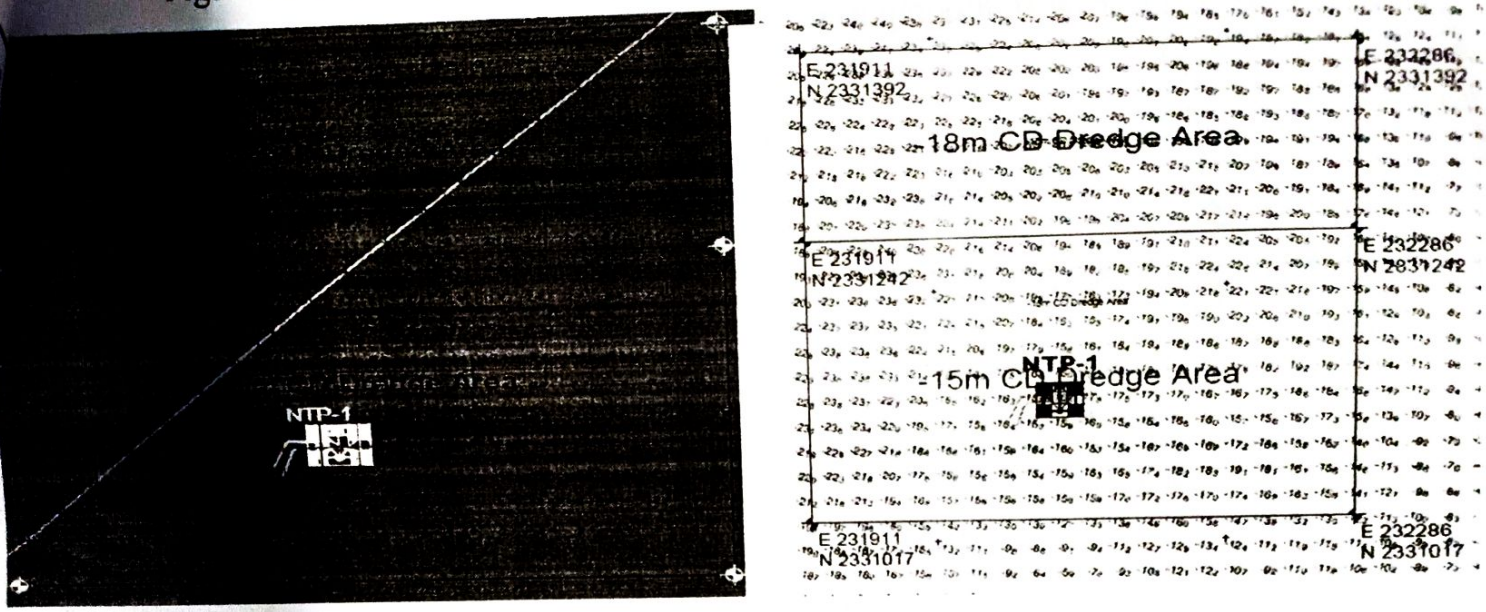



*Figure 5 Plot showing bed level change before and after dredging at NTP location*

From the above graph (figure 5) it can be observed that bed level before dredging is 0.22m for a month, therefore the bed level change for a year will be 2.64m. Similarly, after dredging its 0.04m per month and for a year 0.48m.

Figure 10 Shows working principle of TSHD dredger at disposal location.




10 (a) Shows pre- dredge survey at dredging location (b) shows Post- dredge survey at dredging location

## MAINTENANCE DREDGING.

From the siltation studies is evident that there is an active sand movement in and around the well head areas which is moving from North – East to South West Direction. The drilling rig maneuvering required a depth (-) 12m with reference to CD .The existing Dredge levels are (-) 15.00 m & (-) 18.00 m. Based on the sediment transport report the rate sediment movement rate after dredging is 0.48m / year say 0.5m /year. Considering the shoal moment and sediment transport pattern in Gulf of Khambhat a factor of 1.5 times is added which results in 0.75m / year. The area where dredging is carried for (-) 18.00 m is considered as sand trap and hence the sand trap shall be dredged once in every three years.. The maintenance dredging shall be carried out only in this region. The Sand trap is 3.00 m deeper and once the sand trap is filled up to (-) 15.00m maintenances dredging operation should be commerce.

## CONCLUSION AND RECOMMENDATIONS

Based on the study it is observed that sediment transport rate at the location of dredge location platform is 2.64 m/year before dredging and 0.48m/year after dredging. The average rate of bed level change during the spring tide is 2.3m/year and the average rate of bed level change during neap tide is 0.3m/year at the location of well-head platform. The average rate of bed level change during the spring tide is 0.21m/year and the average rate of bed level change during neap tide is -0.0005m/year (erosion) at disposal location recommended to conduct bathymetry survey in and around the platform before deploying the rig and after deploying the rig. By this exercise, the real time sediment transportation can observed and monitor for the upcoming years.

The dredging was completed on 24 th Dec 2018 and drilling rig was successfully deployed at the platform on 25 th Jan 2019 and the drilling operational will be in progress till April 19 for the Financial Year 2018 and 2019 .

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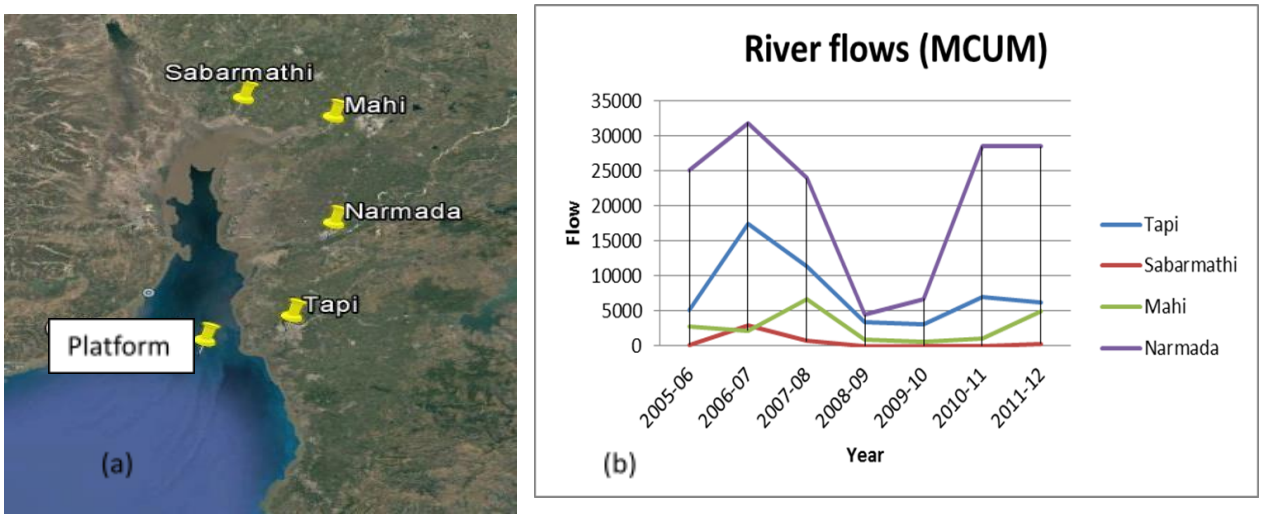


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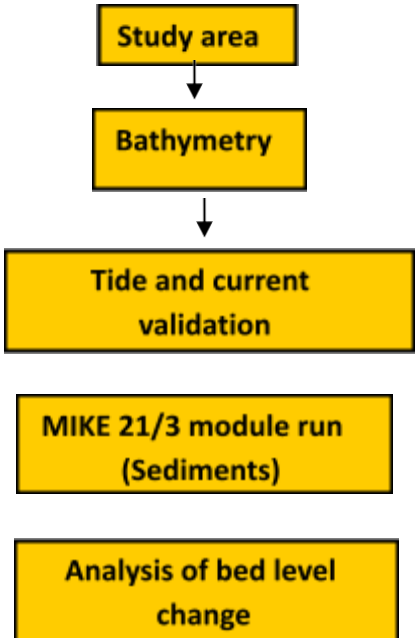
**METHODOLOGY**

The objective is the study of sediment transport pattern due to currents in the gulf region. The numerical model MIKE 21/3 integrated module is adopted. The methodology flowchart is shown below;



**BATHYMETRY**

This involves plotting of sea bed contours. The overall area considered for the siltation analysis is 45x45 km, relatively less area is considered to get accurate answer. The bathymetry of this overall area is generated using Delft dashboard taking the data from GEBCO (General Bathymetric Chart of the Oceans). Once this bathymetry is generated the bathymetry of dredging area was superimposed on it and the model was made ready. Flexible mesh type of model was generated.

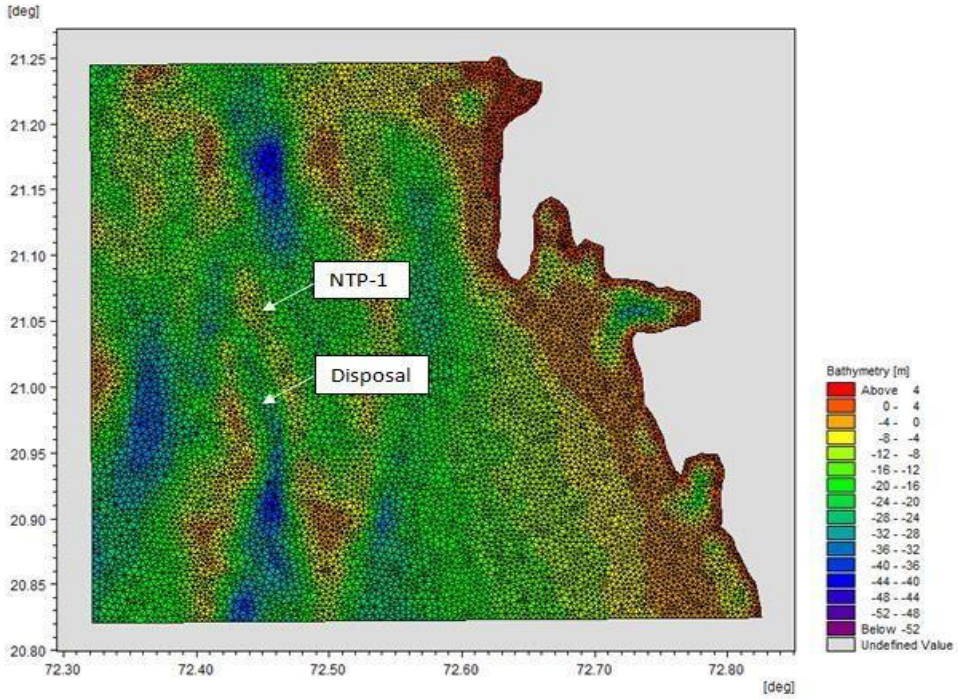



Figure 2 : Shows the Generated bathymetry by incorporating field data.

Using flexible mesh, the model complexity can be reduced by giving different resolution of mesh based on the area of interest. The area away from location can be provided with coarser mesh and the area near to the well-head platform is designed with finer mesh. This flexible meshing helps to reduce the simulation time.

VALIDATION OF MODEL

- Validation of the surface elevation is done using the global tidal data.
- Validation of current is done using the already existing data obtained from the HD model.

VALIDATION OF TIDAL PARAMETER

The model was created by incorporating the bathymetry. Before performing the trial runs the model calibration is to be carried out. The tidal data for gulf of Khambhat was generated with the tide generation tool box available with Mike 21. The generation was done based on bathymetry and the spatial position of study area. The tide data was generated

for a period of one month. The generated data is to be calibrated before using for further analysis. Hence the tide data for the project area was extracted from the domain of Global tide elevation for the generated period of one month. The generated data and extracted data were in fairly good agreement (Figure 7.1). The comparison of the two data sets is furnished in table 2

*Table 2 Tidal condition*

| Tidal condition | Simulated data | Global tide data |
|---|---|---|
| **Spring tide (m)** | 6 | 6 |
| **Neap tide (m)** | 3 | 3 |

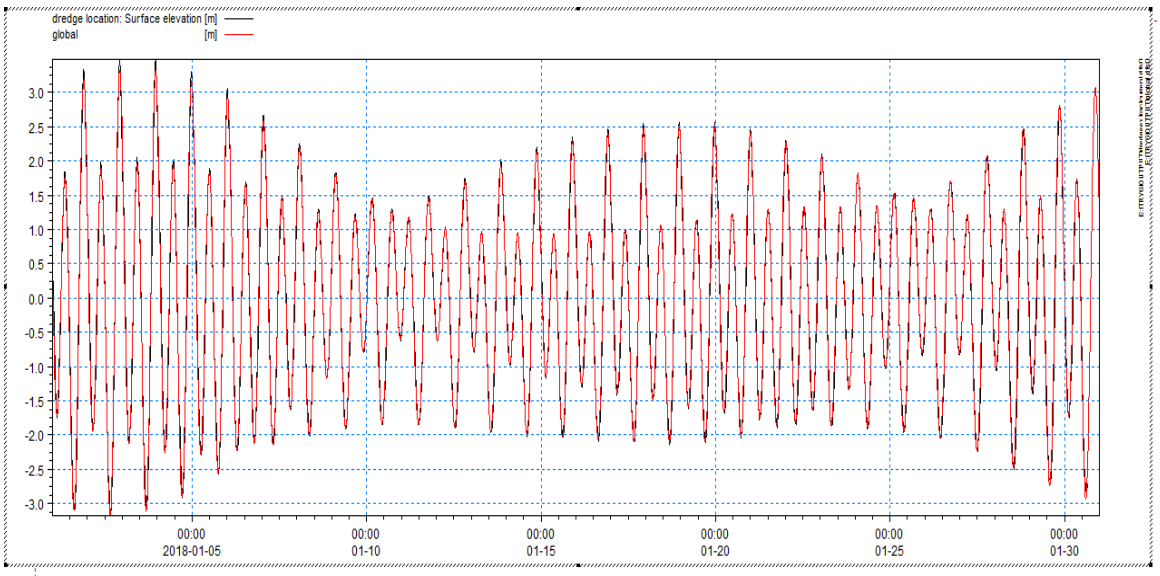



*Figure 3: Time series of water level variation obtained by simulation and global data*

The above graph shows the comparison of global tide elevation and model simulated tidal elevation. This comparison is made for the validation purpose.

VALIDATION OF CURRENT AT THE LOCATION OF DREDGE LOCATIONPLATFORM BEFORE AND AFTER DREDGING

The tidal model run was performed with the calibrated data for the location of the well head- Platform . Initially the first trial was carried out for the present existing condition where the bed level is (-)4.00m. Then the second trial was performed after simulating the dredging condition with the bed level dredged to (-)20.00m. The current values extracted for well -head platform.

*Table 4 Current speed*

| | Before dredging | After dredging |
|---|---|---|
| Maximum current speed(m/s) | 2.6 | 1.3 |
| Minimum current speed(m/s) | 0.7 | 0.4 |

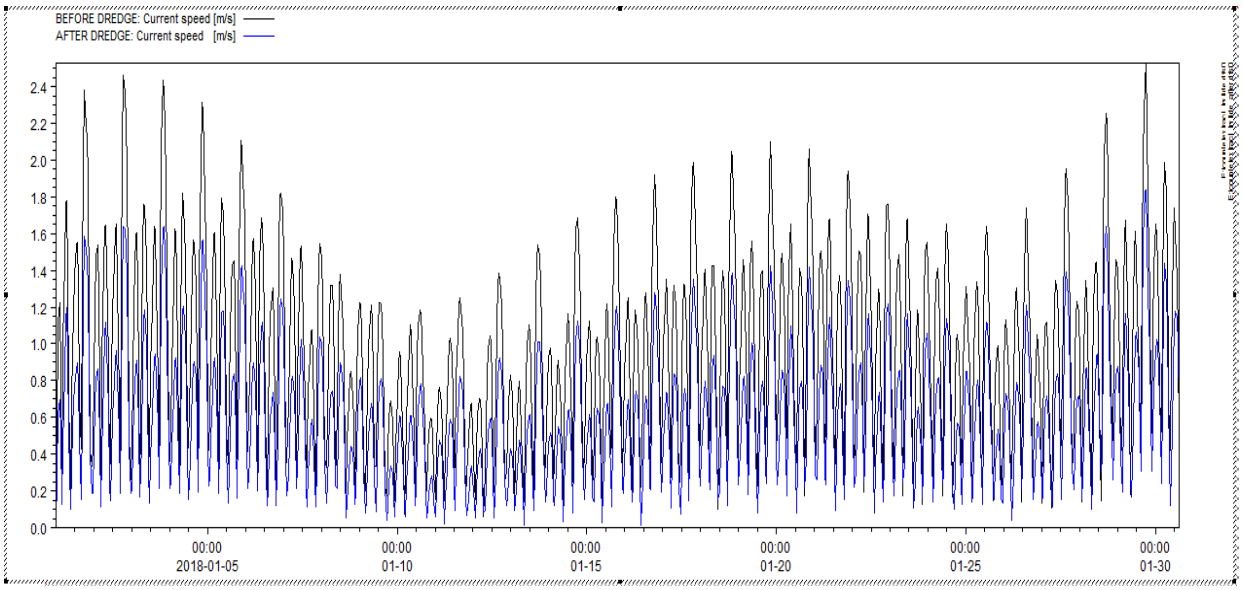



*Figure 4 Time series plot of current speed at NTP location, before and after dredge location*

It can be observed that the current value matches with the previous data obtained in HD module. After calibrating the model with the observed or existing parameters, the model is made ready for further trials.

## RATE OF BED LEVEL CHANGE AT DREDGE LOCATION

The well- head platform is located approximately 24 kilometers from the Tapti river outflow. During the monsoon period the river discharges ample amount of sediment into Gulf of Khambhat through runoff which increases the suspended load and the bed loads of the region. But this sediment content does not contribute to the sediment deposit near well-head platform since the source

The average rate of bed level change in a spring tide (7 days) is 2.3m/year and The average rate of bed level change in a neap tide (7 days) is 0.3m/year.

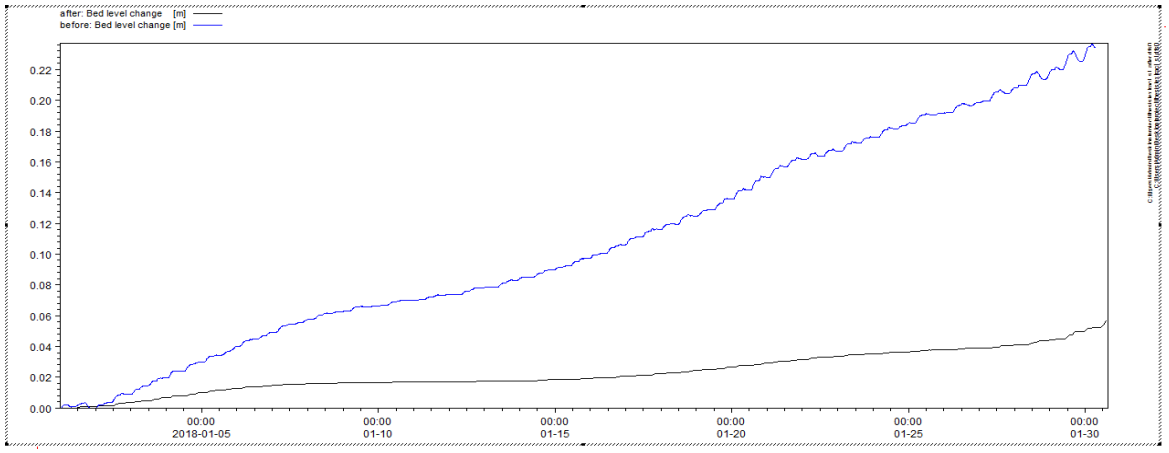



*Figure 5 Plot showing bed level change before and after dredging at NTP location*

From the above graph (figure 5) it can be observed that bed level before dredging is 0.22m for a month,

therefore the bed level change for a year will be 2.64m. Similarly, after dredging its 0.04m per month and for a year 0.48m.

### BED LEVEL CHANGE DUE TO CURRENT AT THE DISPOSAL LOCATION

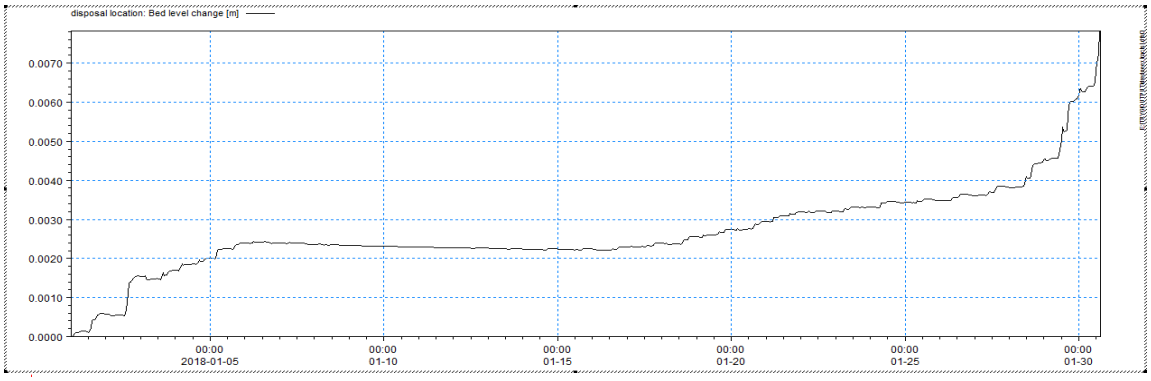



*Figure 6 Plot showing bed level change at disposal location*

It can be observed that the bed level change for one month at disposal location is approximately 0.007m.

### RATE OF BED LEVEL CHANGE AT DISPOSAL LOCATION

The details of sediment deposition in the reach is extracted from the model result and shown vide figure 7. The average rate of bed level change in a spring tide (7 days) is 0.21m/year and The average rate of bed level change in a neap tide (7 days) is -0.0005m/year (erosion) (Figure 7)

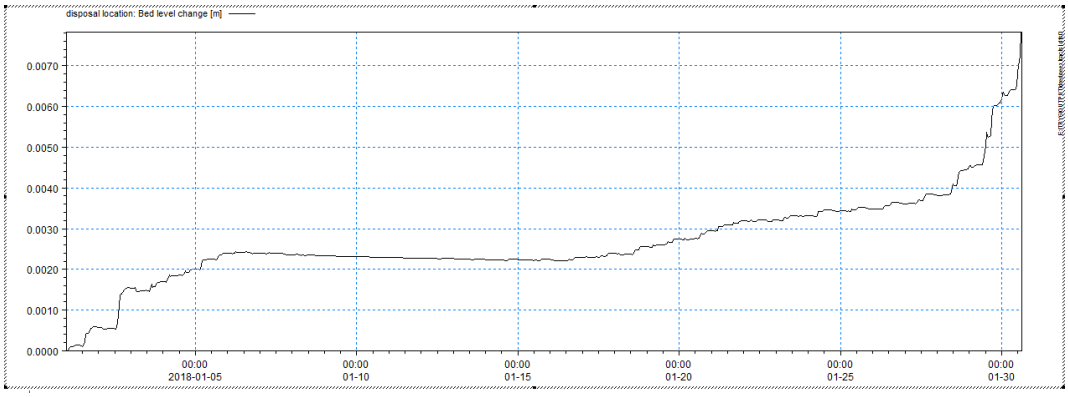



*Figure 7 showing rate of bed level change at disposal location*

## FINDINGS OF THE STUDY

Siltation analysis after dredging for dredging location was simulated with MIKE21/3 integrated module which couples the hydrodynamic with the sediment transport. The domain area is of size approximately 45 kilometers by 45 kilometers. The tidal data was generated, calibrated and propagated in the model. Then the calibrated model is coupled with the sediment model. The model run was performed for the following site conditions;

1. Well-head platform at existing condition with bed level (-)4.00m

2. Well-head platform with dredged bed level of (-)18.00m

3. Disposal area where the bed level is (-)33.00m

The observations of the siltation analysis were extracted and analyzed. The findings of the siltation analysis are as below;

1. It can be observed that the water level in Spring tide is nearly about 6.00m and neap is 3.00m.

2. It can be observed that the current speed before dredging is 2.6m/s and after dredging is 1.3m/s.

3. It can be observed that sediment transport rate at the location of well-head platform is 2.64 m/year before dredging and 0.48m/year after dredging.

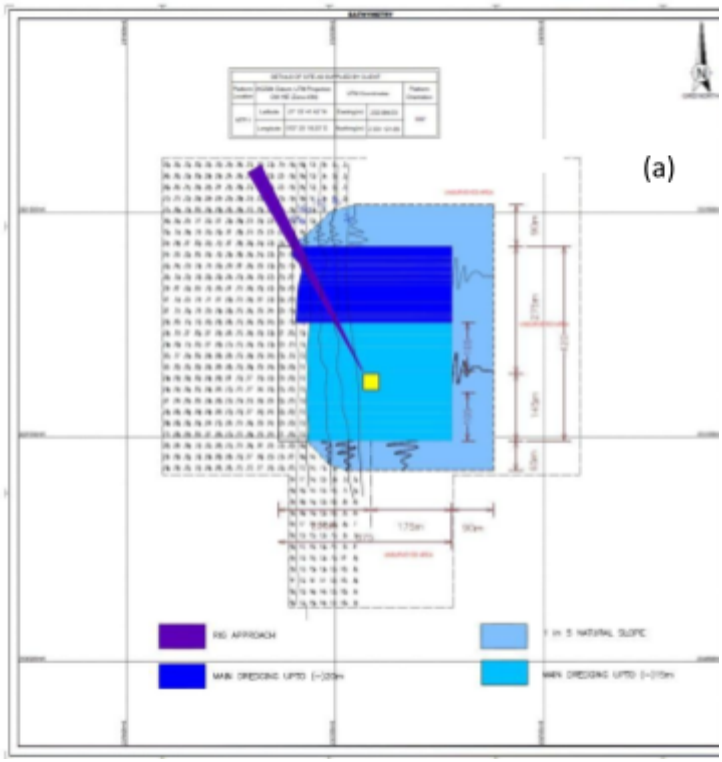
4. The average rate of bed level change during the spring tide is 2.3m/year and the average rate of bed level change during neap tide is 0.3m/year at the location of well-head platform.

5. The average rate of bed level change during the spring tide is 0.21m/year and the average rate of bed level change during neap tide is -0.0005m/year (erosion) at disposal location.

## DREDGING METHORDLOGY ADOPTED BASED ON THE STUDY :

The dredging works was commenced on 10th November 2018. The dredging works was executed by a Trailler Suction Hopper Dredger and supported by Sea Bed Leveling device i.e ( Water injection Dredger WID).

Area of Dredging and Disposal:



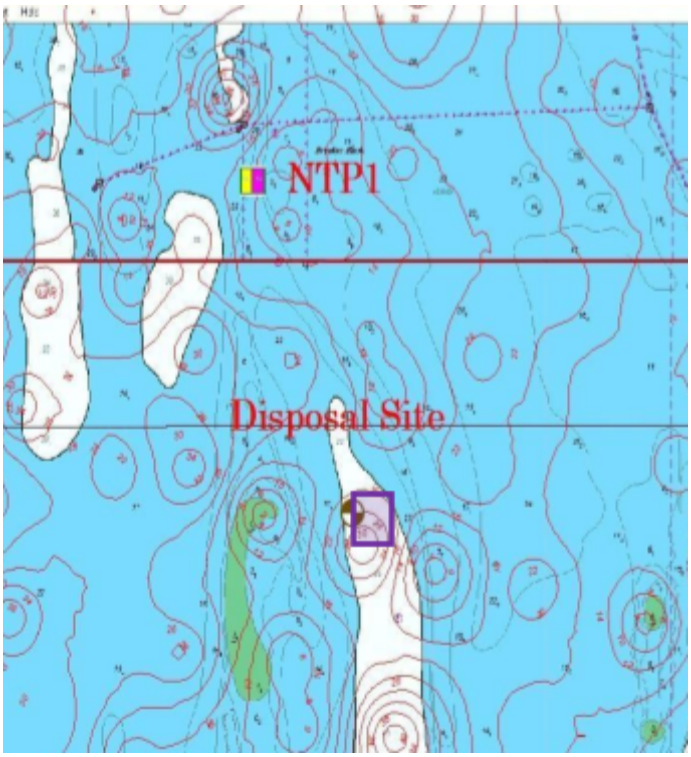



Figure 8 (a) Shows the area of dredging at ongc platform (b) shows the disposal location at deeper contour .

## WORKING PRINCIPLE OF DREDGING AT OFFSHORE PLATFORM :

| The dredging and disposal cycle of a **TSHD** consists of the following | The dredging cycle of a **WID** consists of the following |
|---|---|
| • Lowering suction pipe at the dredging location.<br>• Dredging at the proposed location.<br>• Raising Suction Pipe.<br>• Sail to the disposal location 11 km from dredging<br>• Location.<br>• Open bottom doors<br>• Discharge hopper loads<br>• Close bottom doors<br>• Sail to dredging area<br>Repeat the process. | • WID level the bed level were TSHD cannot reach.<br>• WID shall slide the dredging material from the area closer to the platform towards the deeper contour.<br>• This will enable toTSHD to dredge closer to the platform.<br>• Finally after dredged up to desired depth WID shall level the slopes and sea bed. |

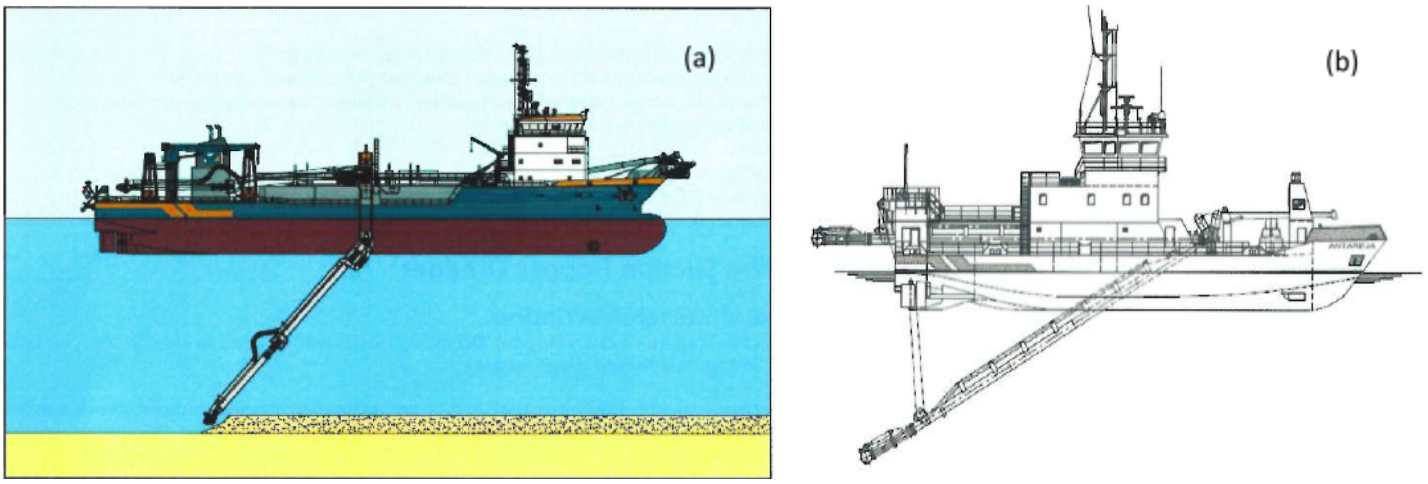



Figure 9 (a) Shows working principle of TSHD dredger at dredging location (b) shows the WID

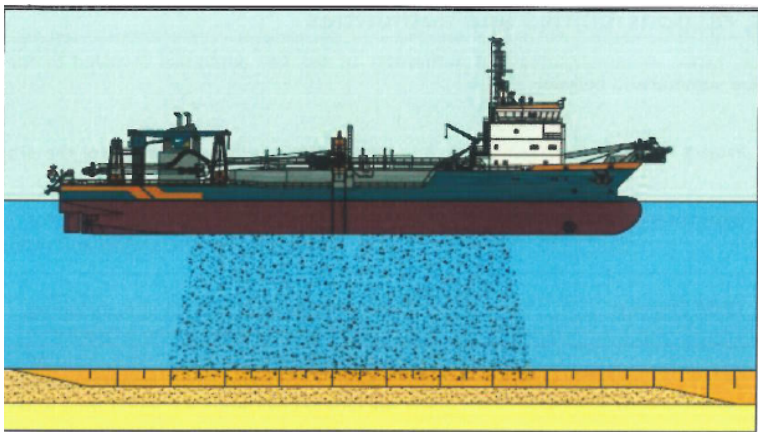
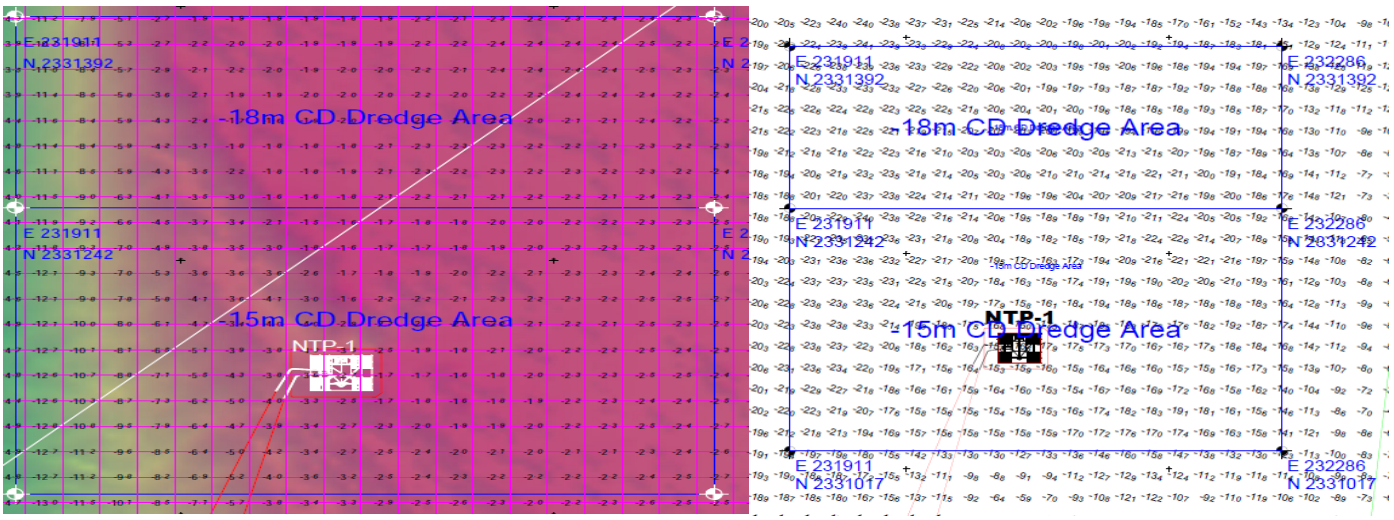


Figure 10 Shows working principle of TSHD dredger at disposal location.




10 (a) Shows pre- dredge survey at dredging location (b) shows Post- dredge survey at dredging location

## MAINTENANCE DREDGING.

From the siltation studies is evident that there is an active sand movement in and around the well head areas which is moving from North – East to South West Direction. The drilling rig maneuvering required a depth (-) 12m with reference to CD .The existing Dredge levels are (-) 15.00 m & (-) 18.00 m. Based on the sediment transport report the rate sediment movement rate after dredging is 0.48m / year say 0.5m /year. Considering the shoal moment and sediment transport pattern in Gulf of Khambhat a factor of 1.5 times is added which results in 0.75m / year. The area where dredging is carried for (-) 18.00 m is considered as sand trap and hence the sand trap shall be dredged once in every three years.. The maintenance dredging shall be carried out only in this region. The Sand trap is 3.00 m deeper and once the sand trap is filled up to (-) 15.00m maintenances dredging operation should be commerce.

## CONCLUSION AND RECOMMENDATIONS

Based on the study it is observed that sediment transport rate at the location of dredge location platform is 2.64 m/year before dredging and 0.48m/year after dredging. The average rate of bed level change during the spring tide is 2.3m/year and the average rate of bed level change during neap tide is 0.3m/year at the location of well-head platform. The average rate of bed level change during the spring tide is 0.21m/year and the average rate of bed level change during neap tide is -0.0005m/year (erosion) at disposal location recommended to conduct bathymetry survey in and around the platform before deploying the rig and after deploying the rig. By this exercise, the real time sediment transportation can observed and monitor for the upcoming years.

The dredging was completed on 24 th Dec 2018 and drilling rig was successfully deployed at the platform on 25 th Jan 2019 and the drilling operational will be in progress till April 19 for the Financial Year 2018 and 2019 .

References:

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# Remedial Measures to Combat Sea Erosion Along West Coast of India


**R. Sundaravadivelu, S. Sakthivel, and P. K. Suresh**

**Abstract** The west coast of India from Kanyakumari (Cape Comorin) to Trivandrum bordering Arabian sea is a thickly populated one. Fishing is the main occupation of the hamlets. The coast is prone to southwest (June–September) and northeast monsoon (October–December) waves in every year. The southwest monsoon is severe along the coast creating heavy erosion resulting loss of valuable lands, roads, worship places and houses. Mandaikadu is one such affected coast located on the west coast of Indian Ocean. Studies in the form of field observations, bathymetry and numerical model studies were carried out. Based on the findings, groin field with six numbers were proposed, and field observations indicate littoral drift is directed towards west direction. The details of studies and effect of groins were highlighted in the paper.

**Keywords** Groin · Littoral drift · Numerical model

## 1 Introduction

The coastal regions of India are densely populated and nearly 20% of the total population of India living in these regions. Further, there is an increase in the developmental activities in the coastal regions in the recent years for shipping, setting up of industries, developing recreation centers, land reclamation and utilizing marine resources of various kinds. Further, the exploration of natural living and non-living resources in the ocean has necessitated construction of a variety of structures like jetties, dykes, seawalls, groins, platforms, pipelines, etc. which are linked to the economy of the coastal states and ultimately to our national economy. In order to combat erosion,

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V. Sundar et al. (eds.), *Proceedings of the Fifth International Conference in Ocean Engineering (ICOE2019)*, Lecture Notes in Civil Engineering 106,
https://doi.org/10.1007/978-981-15-8506-7_19

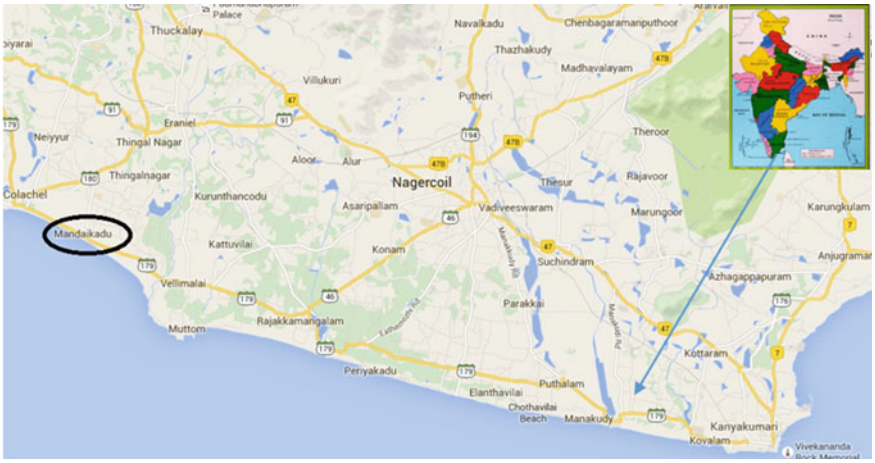


**Fig. 1** Study area

construction of seawall had been the most widely adopted structural measure. Over the last few years, coastal protection measures like sea wall and groins were adopted. The results of the projects have been found fruitful as claimed by Sundar [1]. The western coast of Tamil Nadu in India is steep and characterized by several rocky outcrops. The coast experiences high swell waves during the southwest monsoon that break near the coast leading to heavy erosion of beaches, whereas during the post-monsoon season, the coast experiences accretion resulting in recovery of lost beaches. Mandaikadu is one such affected coast which has a latitude of 8° 23′ N and longitude 77° 32′ E on the west coast of Indian (Fig. 1). As a part of designing remedial measure, the studies were carried out.

## 2 Scope of the Work

As a part of protection measures, a groin field was designed based on the bathymetric details furnished by the client.

## 3 Methodology

The components include the following as detailed below.

- Bathymetric survey
- Field visit
- Desk studies

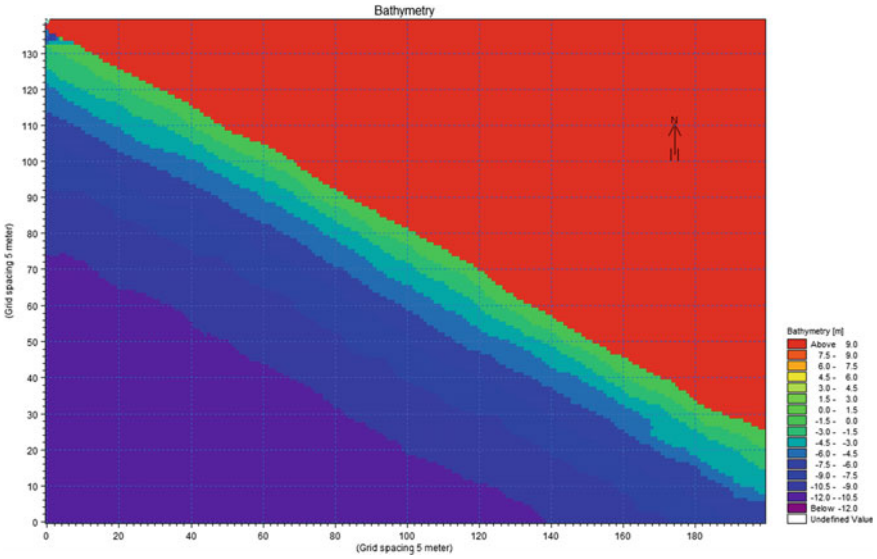


**Fig. 2** Digitized bathymetry

- Numerical model studies
- Formulation of proposal

## *3.1 Bathymetric Survey*

A detailed survey of the area covering a distance of 1100 m alongshore and 600 m towards water was carried out. A total of 1706 numbers of water depth points were collected. The shore is existing with an elevation of (+) 6.00 m at a distance of 50 m behind shoreline. The bed slope in water depth of (−) 10 m is 0.0455. The foreshore slope was seen up to a water depth of about (−) 10.00 m which is about 0.0455. The bed slope up to (−) 3.00 m is 0.060 indicating that profile has steeper slope in the shallow depth compared to deep water. This can result in run-up of wave height ranging from 1 to 3 m and break close to the shore. The digitized form of bathymetry and original one is shown vide Fig. 2.

## *3.2 Field Visit*

In order to ascertain the details of coastal process activity along Mandaikadu coast, field visit was undertaken. The coast is found to be oriented in east–west direction from Kanyakumari to Trivandrum and takes a south–north orientation. The site has

a big church located very near the coast and a famous temple inside along east and west boundaries. Beach of width about 20 m is seen along the length. The coast undergoes severe erosion in southwest monsoon, and hence, temporary protections at selected location by dumping stones and retaining walls are noticed.

### *3.3 Desk Studies*

Along the west coast, there is heavy erosion during southwest monsoon months and then deposition during the other months. Along this coast, the onshore–offshore transport is high during SW monsoon. The magnitude of erosion during SW monsoon increases from Manakudy to Erayumanthurai. This is due to an increase in the foreshore slope. This also indicates that the cross-shore sediment transport plays a major role along the west coast. The analyses of existing data on beach migration indicate that beaches along the coast are visible from January to May and disappear during southwest monsoon. This is because of wave actions almost normal to the shore and creating erosion profile. During the months of January to April, the occurrences of swell waves bring back the beach successfully. Beaches are seen on the east side of protruding structures indicating net longshore transport is on towards west.

### *3.4 Wave Climate*

The data on wave climate is an important parameter while estimating the shoreline changes. Unfortunately, measured or visually observed wave data is available only for locations of port. Hence, numerical models were resorted to for the simulation of wave climate. In the present study, the wave data is adopted from the wave climate generated [4] by numerical models. The two wave models that were adopted are offshore spectral wave (OSW) or WAM model and near spectral wave (NSW) models of MIKE21 developed by Hydraulic Institute, Denmark [2]. The coast is influenced waves from south. Waves are predominantly from southeast, south and southwest. The monthly average wave climate is as described in Suresh [4] presented rose sketch of wave climate is prepared for three seasons, namely non-monsoon (NM) (January–May), southwest monsoon (SW) (June–September) and northeast monsoon (NE) (October–December). The diagrams are furnished vide Fig. 3.

### *3.5 Analyses of Critical Wave Climate*

The west coast is oriented in E–W direction receiving waves from SE, SW direction. The bathymetry was digitized using Mike21 software. Parabolic mild slope model was used for analyzing a value of 3 m wave height. The results of the analyses were

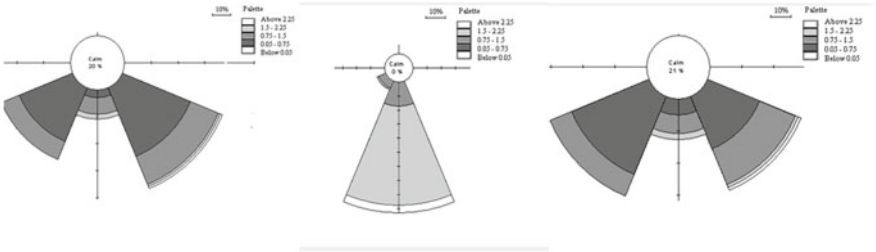

**Fig. 3** Wave rose (NM, SW and NE)

plotted in the form of contours showing wave height for all the above-mentioned conditions. The results indicate high wave heights prevailing in the vicinity of shore (Fig. 4). This high energy waves finally dissipate on the coast leading to erosion of the coast.

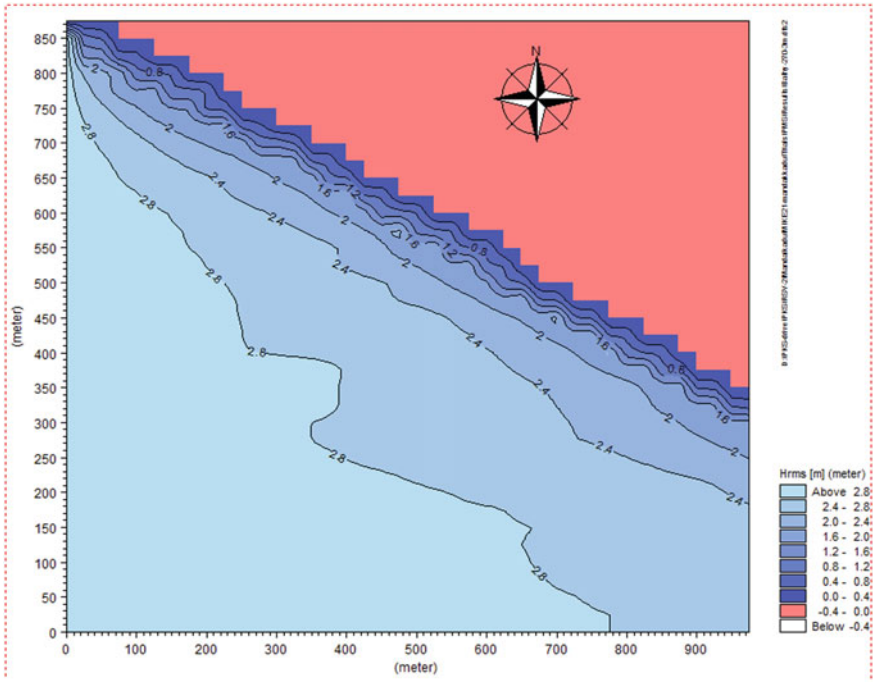


**Fig. 4** Wave propagation from west

## 3.6 Tides

Mean high water spring (+) 1.20 m CD.
Mean sea level (+) 1.00 m CD.
Mean low water neap (+) 0.90 m CD.
Mean low water spring (+) 0.70 m CD.
A storm surge of up to 1.0 m is expected at site during design cyclone, based on the storm surge analysis.

## 3.7 Protection Measures

The protection measures consist of a groin field with five groins. The commencement of the groin field is from the coast adjacent to church. It consists of six groins G1, G2, G3, G4, G5 and G6 of length 65 m, 81 m, 90 m, 60 m, 63 m and 60 m, respectively. The corresponding depth at which the above groins terminate is (−) 2.0 m, (−) 3.0 m, (−) 3.0 m, (−) 2.0 m, (−) 2.0 m and (−) 2.0 m. The spacing between the groins G1 to G6 is 100 m, 150 m, 150 m, 150 m and 100 m, respectively (Fig. 5).

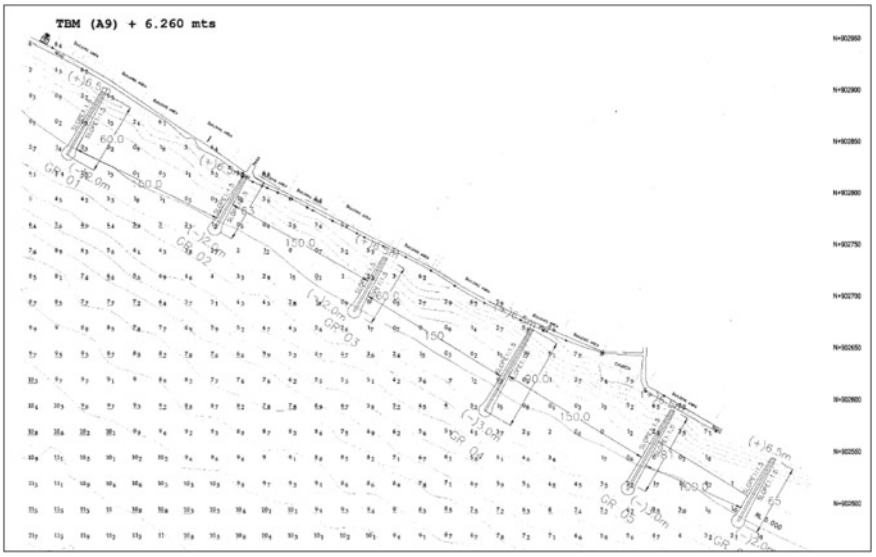


**Fig. 5** Proposed groyne field

## 4 Breaker Angle Variation

The direction of sediment transport mainly depends on breaker angle values. The monthly breaker angle values are estimated based on Snell's law, and furnished (Fig. 6) alongshore current is responsible for accretion near protruding structures. Many empirical relationships are available. The important parameters are breaker angle, breaker height, slope, orientation of shoreline and particle size. As per the studies and findings of Suresh [4], the expression by Van Rijn [3] is suitable. The alongshore sediment transport was calculated using the approach of Van Rijn [3] for the coast.

The longshore sediment transport is dominant during the months of January–April and October–December. Based on the estimated values of breaker angle, the sediment transport in the alongshore direction is assessed as 0.05 million cubic meter. The direction as assessed from calculations and satellite imageries is directed towards west. During the other months, the formation of rip currents results in erosion profile formulations along the coastal reach discussed, and this type of formation is discussed.

### *4.1 Shoreline Evolution*

The artificial interventions in the form of hard structures like groins will have impact on the existing shoreline and should be done carefully after doing prediction of shoreline changes. In the present study, six groins are recommended and the shoreline prediction adjacent to them is predicted for one year [5]. These predictions are based on the approach of Kraus and Harikai [6]. The procedures adopted by Suresh et al. [7] are adopted for assessing the changes along the shore in the presence groin field. The predictions indicate that groins will be bypassed. After the initial construction, it is to be provided with a "T" head in later stage. The construction commenced in December 2017. The four groins namely G3, G4, G5 and G6 has commenced. G3

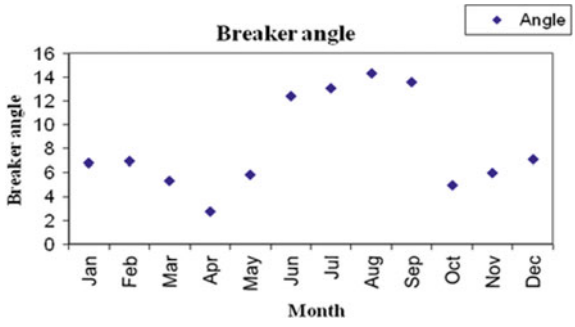


**Fig. 6** Breaker angle


**Fig. 7** Pre- and post-project scenario

is almost completed. The beach formation up to 80 m was noticed by January 2019, and it is offering very good protection against the waves (Fig. 7).

## 5 Conclusion

The coast under study is under heavy threat of erosion. The groin field was proposed after detailed bathymetry, desk studies and numerical modeling. The post-performance of the project indicates that model predictions were reasonably well, and once completed in full fledge, the erosion will be minimized. The net littoral drift predicted towards west was well validated by beach observation on east side of groins.

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TEAM : 1

# *KNOWLEDGE ENGINEERING FOR E-GRIEVANCE*

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***Abstract — Entity resolution (ER), also known as duplication detection, record linkage, etc. is the task of finding records referring to the same real-world entity in a dataset. A common framework of entity resolution is to first find similar record pairs, and perform the threshold-based similarity join under some similarity metrics, and then combine these pairwise results to partition all records into groups, each of which representing the same real-world entity.***

***This paper deals with rule-based entity resolution for E-grievance. Entity resolution is a widely explored analysis community. All this time it has been convention to transmit and thereafter receive assistance for the complaints manually; this takes plenty of time to complete the process.***

## I.INTRODUCTION

Data Mining also called as data discovery is the process of discovering patterns in large data sets involving methods at the intersection of machine learning, statistics, and database systems. It is the practice of examining large pre-existing databases in order to generate new information. Data mining is the analysis step of the "knowledge discovery in databases" process, or KDD. Aside from the raw analysis step,it also involves database and data management aspects, datapreprocessing, model and inference considerations,interestingness metrics, complexity considerations, post-processing of discovered structures, visualization, and online updation.Data mining is the process of analyzing hidden patterns of data according to different perspectives for categorization into useful information, which is collected and assembled in common areas, such as data warehouses, for efficient analysis, data mining algorithms, facilitating business decision making and other information requirements to ultimately cut costs and increase revenue.

## II. PRESENT SYSTEM

In this project, the matter of rule-based entity resolution for E-grievance is observed. Entity resolution (ER) is a wide explored analysis community. Earlier, sending the complaints and helping the complaints to specific terms area unit wiped out manual method. In the proposed system, enforcement of the rule-based entity resolution for sending the E-grievance is being implemented. As a result of the elapsing of some time, records concerning the same entity discovered in various time periods may even be totally different. Besides ancient similarity-based ER approaches, by strictly exploring several information quality rules, e.g., matching dependency and data currency, plentiful information are obtained to facilitate and to handle this draw back. Throughout this project, usage of such rules to assign the work to individual department mechanically is implemented. Hence, the experimental result on every real and artificial information shows that the entity resolution technique helps in achieving every high accuracy and efficiency on datasets with hidden temporal information.This also solves the problems of entity resolution on inaccurate temporal knowledge. A rule-based ER methodology to handle the entity price evolution effectively for process E-grievance is observed here. By applying rules to assign the work to individual department mechanically and to work out the currency order of records from target attributes is applied . Numerous experiments on each real-life and artificial knowledge verify the ways out-performs ancient ways in entity resolution

# A SURVEY ON HUMAN ACTIVITY RECOGNITION TECHNIQUES

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**Abstract**—Human activity recognition is the problem of analyzing the human movement and recognizing various activities that are performed. Human activity recognition has a wide range of applications in many areas. Human activity recognition plays a significant role in the area of surveillance. In surveillance systems, human activity recognition is used to detect any abnormal behavior and to prevent them .This paper gives a study of various human activity recognition techniques such as single human activity recognition, human-object activity recognition , multiple human activity recognition.

**Keywords**—*Activity recognition; human-object interaction ;human-human interaction, feature extraction, object detection*

## I. INTRODUCTION

A large number of videos are being captured by the surveillance cameras everyday . The surveillance cameras are available everywhere and the number of videos generated by these cameras are enormous. Therefore , to monitor human activities ,human activity recognition techniques can be used to determine abnormal human behavior. Various methods have been proposed to determine the human behavior and these are classified based on the interaction among the moving objects in the video.

Surveillance systems demand for incorporation of smart systems that automatically recognize human activity .Abnormal activities are the activities that are rarely performed by humans. Normal activities occur frequently.Hence , by comparing the features ,abnormal activities can be differentiated from normal activities.

The sections in this paper are organized as follows. Section II describes the works related to single human activity recognition , Section III describes the works related to human object interaction recognition ,Section IV describes the work related to multiple human activity recognition, Section V gives the performance analysis off various techniques, Section VI deals with the challenges involved in activity recognition ,Section VII gives the conclusion and section VIII gives the references..

## LITERATURE SURVEY

## II. SINGLE HUMAN ACTIVITY RECOGNITION

Single human activity includes the activities that are performed only by a single person such as walking, falling , jumping, etc .

In[1], B.Robert , B.Jackson and N.Papanikopoulos had proposed a system that would track human in videos and would recognize the activity that is being performed by them. Human tracking is done by foreground segmentation using Gaussian mixture model and kalman filter .Human activity is recognized by calculating the position and velocity features. A warning is produced when the pedestrian enters the prohibited area or loiters for a longer time. However , the limitations pertaining to the system are that the system cannot adapt to rapid changes in illumination of the scenes

In[2], E. Abdalrahman, S. Cheema, C. Thurau and C. Bauckhage proposed a system that uses the temporal key poses. The motion history images and the motion energy images are used to produce a newer representation of the key poses. The dastasets that are used in this system are the MuHAVi dataset and the Weizmann dataset. For the MuHAVi dataset an accuracy of 98.5% is achieved. The major shortcoming of this work is that the results vary with changing camera views.

In[3], W. Lu and J. Little presented a template-based algorithm to track the actions of an athlete. This system used principal component analysis and histogram of oriented gradients to represent the athlete. Tracking has been done for hockey and soccer video sequences . The system is found to produce good results

TEAM No: 4

# IOT :WEARABLES TO MONITOR PILOT'S HEALTH

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***Abstract***—Pilots' drowsiness and stress has been a very serious cause of many air accidents, which makes it a great social and economic concern. This paper describes a system which uses ECG (Electrocardiogram) sensor, Heartbeat sensor and a eye blink sensor to obtain physiological readings of pilots' health condition . Generally signals are transmitted to base Tower as High frequency radio signals, which is used for practical test and classify data using classification algorithms. This is an intelligent system which playes key factor to avoid many unreliable situations .
Keywords—SVM Classifier, KNN Classifier,IOT

## I.INTRODUCTION

Recently, the has been increase in accident due to poor stability of pilot which in turn has caused many serious havoc. From ages , pilot's drowsiness and stress have been one of the major causes of accidents. Using trending platforms such as Internet of things (IOT) and best classification algorithm, any glitch in the input can be easily identified.. For these reasons, many researches has been adopted by Société Internationale de Télécommunications Aéronautiques (SITA) to study the pilot's physical conditions and convert them as data points or signals and transfer them to tower. This system uses sensors ,IOT platform and classification algorithms to actively classify the data . However, the existing methods or system to measurement the physiological signals of pilot are very inconvenient and in accurate because it doesn't use any classified algorithm to monitor the health conditions. To improve these inconvenient factors, researches over the relations between drowsiness and fatigue are studied by using wearable sensor and classification algorithms. Many efforts has focused on retrieving to get the physiological signals or data under convenient and noninvasive environment.

## II.EXSISTING SYSTEM

As such there is no proper existing system to monitor health condition, except alarming "black box". Hence in this study we are comparing it to driver so that a better optimal solution can be arrived . When the driver is stressed, fatigued, or drowsy, mind becomes incapable to think and hence these abilities degrade his health . Stress has been a key role to suppress driving performance and increases the likelihood of traffic accidents. Drowsiness is one of the major factors leading to driving errors, resulting in dangerous driving situations and sometimes fatal conditions. . The Department of Transportation National Highway Traffic Safety Administration reported that approximately 100 0000 crashes occur per year in the United States owing to drowsy driving.[2]Thus, driver's drowsiness and stress has been major cause of the traffic havocs, which makes this an area of great socioeconomic concern.

### *A. Composition of Sensors and Wireless Sensor Node*

To obtain physiological signals and data, ECG and PPG sensors are fixed on the steering wheel for drivers. ECG and PPG sensors designed such that they are attached with wireless sensor node for enabling wireless communication. Conductive fabric electrodes are used for measuring of ECG signals on the steering wheel to maximize convenience.[1]

### *B. Personal Area Network*

Personal area network is used as a communication tool to send data to computing devices. All retrieved physiological signals from both the sensors can be approximately sent to a base station with very low packet loss and low power operation by using personal area network that serves to interconnect and communicate all wireless sensor nodes themselves in the car. In PAN nodes is operated by TinyOS which is an open source operating system mainly for wireless embedded sensors networks.

### *C. Analysis of Heart Rate Variability Signals*

For analyzing the measured physiological signals or data points, HRV signals are used. This is defined as the constant change of the interval between heart rate.
HRV signals are usually calculated by analyzing a continuous series of beat to beat intervals from the ECG or derived from a pulse wave signal measured by means of the PPG waveform. In the personal area network environment inside a vehicle, HRV signals are obtained by signal processing. In the existing uses the interpretation of HRV signals in time and frequency domain to monitor the car driver's condition accurately.

### *D. Flowchart*

This diagram represents the flow of the system for detecting the drowsiness and fatigue of the driver using HVR signals. The signal is later on monitored by individual. Experiments are done to observe the monitoring performance using ECG and PPG sensors in real time as shown . HRV signals are obtained from measured ECG and PPG signals in the vehicle under personal area network environment. Two authors who are healthy without any heart diseases clinically participated in this experiment. It proves that sympathetic nervous system and parasympathetic nervous system of autonomic nervous system are active appropriately. On the other hands, HR distribution is spread narrowly and centrally under drowsy state as shown in Fig. 2.Three main spectral components arerequired for spectrum power indicator: very low frequency (VLF), low frequency (LF), and high frequency (HF) components. Measurement of VLF, LF and HF power components.[3]

Team :- 05

# Road Traffic Recommendation by Multi-source Diffusion Modelling

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***Abstract*** — Road traffic speed prediction is a challenging problem in intelligent transportation system (ITS) and has gained increasing attentions. Existing works are mainly based on raw speed sensing data obtained from infrastructure sensors or probe vehicles, which, however, are limited by expensive cost of sensor deployment and maintenance. With sparse speed observations, traditional methods based only on speed sensing data are insufficient, especially when emergencies like traffic accidents occur. To address the issue, this paper aims to improve the road traffic speed prediction by fusing traditional speed sensing data with new-type "sensing" data from cross domain sources, such as tweet sensors from social media and trajectory sensors from map and traffic service platforms. Jointly modeling information from different datasets brings many challenges, including location uncertainty of low-resolution data, language ambiguity of traffic description in texts, and heterogeneity of cross-domain data. In response to these challenges, we present a unified probabilistic framework, called Topic-Enhanced Gaussian Process Aggregation Model (TEGPAM), consisting of three components, i.e., location disaggregation model, traffic topic model, and traffic speed Gaussian Process model, which integrate new-type data with traditional data. Experiments on real world data from two large cities validate the effectiveness and efficiency of our model.

**Keywords-ITS, Raw speed sensing data, tweet sensors, TEGPAM**

## I.INTRODUCTION

Road traffic monitoring is of great importance for urban transportation system. Traffic control agencies and drivers could benefit from timely and accurate road traffic prediction and make prompt, or even advance decisions possible for detecting and avoiding road congestions. Existing methods mainly focus on raw speed sensing data collected from cameras or road sensors, and suffer severe data sparsity issue because the installation and maintenance of sensors are very expensive. At the same time, most existing techniques based only on past and current traffic conditions do not fit well when real-world factors such as traffic accidents play a part.

## II. RELATED WORKS

Previous studies normally perform Traffic clustering based on only a single information source, such as location data; by viewing shared location as the sole determinant of community relationship, real relationships may be missed or non-existent communities may be falsely identified.

In the social graph community detection literature, a community is usually defined over a link-based graph capturing direct pair-wise interactions; such explicit interaction markers are obviously hard to directly obtain in many practical environments due to privacy concerns or technological limitations.

# Unauthorized User Analysis With Machine Learning For Web Repository Results

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***Abstract*** **—Information sharing is the key goal of Cloud Storage servers. It allows storage of sensitive and large volume of data with limited cost and high access benefits. Security must be in given due importance for the cloud data with utmost care to the data and confidence to the data owner. But this limits the utilization of data through plain text search. Hence an excellent methodology is required to match the keywords with encrypted cloud data.The proposed approach similarity measure of "coordinate matching" combined with "inner product similarity" quantitatively evaluates and matches all relevant data with search keyword to arrive at best results.This approach, each document is associated with a binary vector to represent a keyword contained in the document. The search keyword is also described as a binary vector, so the similarity could be exactly measured by the inner product of the query vector with the data vector. The inner product computation and the two multi-keyword ranked search over encrypted data (MRSE) schemes ensures data privacy and provides detailed information about the dynamic operation on the data set and index and hence improves the search experience of the user.**

***Keywords—Cloud storage server, MRS(Multi-Keyword ranked search),Relevance score***

## I.INTRODUCTION

The term Cloud refers to a Network or net. In alternative words, we will say that Cloud is something thatare given at remote location. Cloud will give services over network. Service Models are the reference models on which the Cloud Computing relies on. These may be classified into three basic service models as listed below:

- Infrastructure as a Service (IaaS)
- Platform as a Service (PaaS)
- Software as a Service (SaaS)

There are several alternative service models all of which may take the shape like SaaS and Anything as a Service. Thiscan beNetwork as a Service, Business as a Service, Identity as a Service, information as a Service or Strategy as a Service.

The Infrastructure as a Service (IaaS) is the simplest level of service. Every service models creation uses the underlying service model.The planned approach similarity live of "coordinate matching" combined with "inner product similarity" quantitatively evaluates and matches all relevant information with search keyword to make best results. Then that user can able to upload the same document with changes in that document that document modified words are updated in the individual page.

The proposed concept mainly focuses the individual page updation of the multiple page documents. We are introducing the system to update the particular modified page or word in that particular document when it can be uploaded again.Recent generations of computing is based on the searching of documents or contents in a huge data repositories. Storing the data and retrieving it in an efficient manner becomes a prominent challenging task in the recent generation.Enhancement is going on in system usability by enabling search result relevance ranking instead of sending different and irrelevant results, and further it ensures the file retrieval accuracy based on the data requested.

## II. EXISTING SYSTEM

A large number of data users and documents in cloud is difficult for the search services to allow multi-keyword search query and provide result similarity ranking to meet the effective data retrieval need.

The searchable encryption concentrates more on single keyword search or Boolean keyword search, and it rarely differentiates the search results.By stop word concept the unwanted keywords will be removed.

Team No: 67

# Location Identification for Non-Geotagged Tweets

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***Abstract*** — *As social media users are increasingly going mobile, various location based services (LBS) have been deployed on social media like Twitter. The success of them heavily depends on the availability and accuracy of users' location information. However, only a small fraction of tweets are geo-tagged. Thus, it is necessary to infer locations for tweets in order to attain the purpose of LBS. In this paper, we tackle this problem by scrutinizing Twitter user timelines. First, we split each user's tweet timeline temporally into a number of clusters, each tending to imply a distinct location. Subsequently, we adapt two machine learning models and design classifiers that classify each tweet cluster into one of the pre-defined location classes at the city level. The Support Vector Classifier focuses on the information gain of words with location implications in the user-generated contents.*

***Keywords:*** Random Forest Classifier, Support Vector Classifier, Data mining

## I.INTRODUCTION

Social media users are going mobile. For example, 53.5% of Facebook users login only from the mobile devices by the end of July, 2016, and Twitter has approximately 257 million mobile active users monthly as per the first quarter in 2016. This big trend has fostered various location based services deployed on social media. The success of such location based services heavily depends on the availability and accuracy of users' location information that a social media platform can get access to. Knowing the locations of the individual tweets of users enables a wide variety of applications eg., location-based summarization, location-aware recommender system, friends notification, influential users recommendation, place advertisements and business information spreading, city-scale collective attention analytics and even disaster detection. However, only a fraction of tweets are geotagged i.e., being sent with GPS coordinates. Therefore, it is necessary to infer locations for Twitter users in order to attain the purpose of and to improve the quality of the location-based services offered to the users. The experimental results suggest that the proposed models are effective at inferring locations for tweets and they outperform alternatives significantly in terms of inference accuracy.

## II. EXISTING SYSTEM

Existing techniques for locations in social network fall in two categories: those inferring a Twitter user's location and those inferring locations for tweets. Most of them infer locations at the city level. Several existing techniques make use of social networks and friends' locations to infer locations for Twitter users. Davis Jr.et al. [17] and Jurgens [18] consider the locations of a user's friends and take the friend's location with the majority votes as the user's location. Rout et al. [19] use an SVC classifier and features extracted from Twitter user networks to predict home locations for Twitter users. Back strom et al. [20] study the relationship between friendship and spatial distance for Facebook users, and exploit the relationship

International Journal of Computer Trends and Technology (IJCTT) – Volume X Issue Y- Month 2019

# IMPROVING THE LIFE OF CHILDREN AFFECTED BY AUTISM SPECTRUM DISORDER WITH THE HELP OF IOT

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***ABSTRACT:*** *This paper explicate an innovative IOT system which supports the children with autism spectrum disorder (ASD) and also acts as a guide system of their health. The main aim is to sense their EEG (Electroencephalographic) waves and to keep a track on it using Smartphone. EEG probes present in the cap helps in sensing their brain waves. The recorded brain signals are dispatched to the cloud by making use of the antenna present in the IOT module with GSM. The cloud acts as storage system and those signals are viewed by the application developed. The Therapists and the Guardian make use of this system to follow their children and can understand the complexity of the behaviour. Each autistic children has a marked set of talents and strengths. By making use of this application their skills can be improved to a certain level. This application also strives for improving their vocabulary skills and helps them in communicating.*

**KEYWORDS** – *Autism spectrum disorder (ASD), EEG probes, IOT module with GSM*

## I. INTRODUCTION:

Autism spectrum disorder (ASD) is a neurological disorder that develops in a children within the age of 2 or 3 years. This disorder affects the communication and behaviour of a person. The autistic children have difficulty with communication, difficulty with social interactions, obsessive interests and repetitive behaviours. They also face mental health challenges such as anxiety, depression and attention issues. According to the CDC the number of autistic children have been increased from 1 in 92 in the 2016 report to 1 in 71 in the 2018 report. There are no cures for ASD but therapies and other treatment conisderations can help people feel better and can ease their sysmptoms. Behavioral theraphy, play theraphy, occupational theraphy, physical theraphy, speech theraphy aree some of the treatment methods. This paper makes use of the EEG sensors to sense their brain signals which comes under the IOT domain.IOT is a collection of reticulated computing devices, digital and mechanical machines, objects, animals or people that are provided with unique identifiers (UIDs) and capability to transfer data over a network without requiring human-to-human or human-to-computer interaction. The IOT has countless applications in promoting the health of the patients, from remote monitoring to smart sensors and medical device integration. It has the potential to keep patients safe and hale. Healthcare IoT can also boost patient engagement and satisfaction by allowing patients to spend more time interacting with their doctors.The application developed will certainly promote the lifestyle of the autistic children.This application will not only improve the lifestyle of the autistic children but also help the parents to keep an eye on the child and can monitor their behaviour .It also help the therapist so that the treatment can be varied according to the mental health level.

## II. RELATED WORKS:

Facial, Visual and hand movement response data were used to identify the behaviour of the children in different situations and it was also used to detect their

# A SURVEY ON ONLINE AUCTION USING DATA MINING TECHNIQUES

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**Abstract**--Thousands of people take part in Internet auctions every day, bidding on items from different places. Buyers and sellers alike benefit from the great opportunities that online auctions provide, but these auctions also provide criminals the opportunity to perpetrate fraud. The online auction environment is full of shill and fraud bidders and the losses incurred because of these offending activities are huge. This problem of Shill bidding and fraudulence can be solved by applying Data mining and Machine learning techniques. So, this paper will help us get an idea about different auction types and different data mining and ML algorithms that can be used to prevent the forgery that is prevalent in online auctions

***Keywords—Online auction; Data mining ;Fraud detection***

## I. INTRODUCTION

Online Auction has significantly increased the variety of goods and services which can be bought and sold using the auction mechanisms. Online auction have broken all the barriers that were inhibiting the users for accessing the auction like geographical locations, time and a small target audience. Making auctions online, the numbers of users participating in the auctions have dramatically increased over time. It functions as, the bidder first starts quoting a smaller sum and then it gets increased over other bidders quoting higher amounts in order to win that particular good. The time limits for the auctions differ based on the domain where the auction takes place.

The main benefit of online auction over physical auction is that the user from different parts of the world can participate in the auction and then they are shipped globally. The objects sold can a single product of collection of many. Not all the users who are accessing the system are genuine and it is necessary to identify those who are not legitimate and try to increase theactual amount of the goods being sold.

Popular online auction sites like eBay protects the legitimate user from these swindlers by having a list called bidder block lists. If the user is from the list they are blocked from participating from the bidding. There are greater chances of selling pirated and stolen products.

The various Data Mining and Machine Learning techniques can be used to make the online auction safer and flexible for the user. Techniques like ID3, C4.5, C5.0, CART, Neural networks etc. are studied and analyzed here. This paper also present different other domains where these techniques were used successfully in other domains.

The rest of the paper is organized as follows. Section 2 presents an overview of different Data Mining techniques . Section 3 gives an idea about how CART can be used in different domains. Section 4 depicts how C4.5 can be used. Section 5 gives an outline of usage of other Machine Learning techniques used in acution systems. Section 6 concludes the work.

## LITERATURE SURVEY

### I. OVERVIEW OF DIFFERENT DATA MINING TECHNIQUES

There are different types of data mining techniques used namely Asssociation,Classification,Clustering, Prediction, Sequential patterns,Decision trees.

***I.Association:***

It is a well known and simple data mining technique where, a pattern is identified considering a relationship between two transactions and hence called as Relation Technique. It is generally used in marketing and purchasing domains and generally used for market basket analysis. It is basically to tempt buyers with other products that are frequently bought items. For Example, when a user buys bread placing the jam and butter on the same rack might tempt the user to buy them together, thereby increasing the sales.

***II.Classification:***

This is basically used to classify the items into predefined groups or classes using mathematical techniques like decision trees, statistics etc. For example we will be able to use medical data to classify them as Diabetic and non-diabetic patients so that treatment can be made even more efficient by considering their medical conditions and groups they are placed in.

# Online Shopping Bargain Using Incremental Algorithm

S.Hari Venkatesh, J.Hari Krishnan, S.Gowtham and S.Yamuna

***Abstract---*** *E-commerce -- electronic commerce or EC -- is the buying and selling of goods and services, or the transmitting of funds or data, over an electronic network, primarily the internet. An online shop evokes the physical analogy of buying products or services at a regular retailer or shopping center; the process is called business-to-consumer (B2C) online shopping. Data mining is powerful technology that is widely used in various applications like e-commerce, educational system, remote sensing and online shopping system. it deal with online shopping processes i.e. it is concerned with developing new methods to discover knowledge from online store database. Price promotion refers to the fact that the actual selling price is lower than the price, so that the customer can get a discount on the price.Data Mining Group (DMG) and supported as exchange format by many data mining applications. As the name suggests, it only covers prediction models, a particular data mining task of high importance to business applications using data mining process to shopping the online products using bargain methodologyThe online shopping system presents an online display of an order ,where a customer tries to minimise the selling cost of a product from the administrator ,where to an correct extent the administrator is allowed to sell the product to a finite amount . The interaction is customer and administrator is maintained confidentiality*

## I. Introduction

An online Bargain shopping system that permits a customer to submit online orders for items and or services from a store that serves both walk-in customers and online customers. The online shopping system presents an online display of an order ,where a customer tries to get minimisation of the selling cost of a product from the particular seller.The interaction between customer and seller is maintained confidentially. The request from the customer is sent to the seller and seller applies skyline query to the product and displays the result to thcustomer.Bargain works from admin , since admin gives the permission to seller and grant access to customer ,then the customer buys the product online Gain new customers with search visibility

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## II. Existing System

Online shopping is a form of electronic commerce which allows consumers to directly buy goods or services from a seller over the Internet using a web browser. Consumers - find a product of interest by visiting the website of the retailer directly or by searching among alternative vendors using a shopping search engine, which displays the same product's availability and pricing at different e-retailers. Recent analysis- as of 2016, customers can shop online using a range of different computers and devices, including desktop computers, laptops, tablet computers and smartphones.An online shop evokes the physical analogy of buying products or services at a regular "bricks-and-mortar" retailer or shopping center; the process is called business-to-consumer(B2C) online shopping. When an online store is set up to enable businesses to buy from another businesses, the process is called business-to-business (B2B) online shopping.

## III. Proposed System

### A. Motivation

An online Bargain shopping system that permits a customer to submit online orders for items and or services from a store that serves both walk-in customers and online customers. The online shopping system presents an online display of an order ,where a customer tries to get minimisation of the selling cost of a product from the particular seller.The interaction betweencustomer and seller is maintained confidentially. The request from the customer is sent to the seller and seller applies skyline query to the product and displays the result to the customer.Bargain works from admin , since admin gives the permission to seller and grant access tocustomer ,then the customer buys the product onlineGain new customers with search visibility

### B. Actual working

Registration module-In Online Shopping Process, Admin is the head of the organization. He has all the rights to authenticate the seller and user details. Admin can verify the seller and give approval to them.The Seller has to register first and get the approval from the admin. After the approval process only the seller can have access to login and add the products and cost of their choice. Seller can view the request of the customer for reduce of cost of the product. Seller can get the details of the users and payment details.

Purchase Module:-The customer and seller interacts with each other by the admin request and then the customers selects the seller for the required product to bargain The customers then interacts with the seller and bargain to the seller until to the maximum extend of the cost which profits both the customer and the sellerThe interaction between the customer and seller is maintained confidentiality

ISBN: 978-81-935422-9-7

TEAM - 13



# A SURVEY ON BLOCKCHAIN HANDLING HUGE DIGITAL INFORMATION

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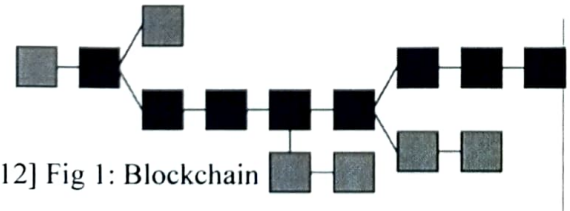
***Abstract:***Blockchain is grouping list of records, called blocks, which are linked usingcryptography. Each block contains a cryptographic hash of the previous block, a timestamp, data and nonce. It is resistant to modification of data. By allowing digital information to be distributed but not copied, blockchain technology created the backbone of new type of internet. This paper deals with applications of blockchain in various domains such as Education, Biomedical, IOT, Supply chain and more.A peer to peer network manages the blockchain communication and validation using protocols when it is used as a distributed ledger. In a distributed environment, when a block is to be added to the chain it requires the permission from half of the nodes in the system. Even though blocks are not completely unalterable they are considered as the role model for a secure distributed system with Byzantine fault tolerance.

**Keywords:**blockchain, survey, application of blockchain.

## 1. INTRODUCTION

A blockchain is a concept to store data digitally. In recent years, there is a lot of buzz on blockchain. Many have described this as a most disruptive technology of the decade. A blockchain, is also called distributed ledger. With a blockchain, many people can write entries into a record of information, and a community of user can control how the record information is amended and updated.

[12] Fig 1: Blockchain



[12] Fig 1: Blockchain

## 2.KEY CONCEPTS

### *2.1 Distributed Ledger*

Ledger is a principal book or computer file for recording and totaling economic transaction. There is no centralized data storage. It relatedly shared across multiplesites and more. Blockchain is a form of distributed ledger. Thus each participate in the blockchain network can access records that are shared across it and can own an copy of it. Any changes or update made to the records are reflected and copied to all the participants in the network in a fraction of second. Changes and update means adding a new block to the existing blocks of data saying the x changes to y in so on so time this is because once the data entered in a ledger it becomes an immutable database.

### *2.2 Consensus*

Consensus can be defined as achieving agreement on a single value over a distributed system. Thus achieving consensus in blockchain states that either a single value or a new block is added only if it is agreed by all the participants in the network. In blockchain systems do not trust each other this is because of Byzantine agreement problem. Consensus therefore should tolerate Byzantine failure.

### *2.3 Cryptography*

Cryptography refers to secure communication by means of encryption and decryption. This means information can be
viewed by authorized person only. [13] "In blockchain cryptography is primarily used for two purposes one is securing identity of the sender of transaction and second is ensuring past records cannot be tampered with. Blockchain uses public key cryptography which is better than symmetric key cryptography".

# Generating Unique ID for Individuals using Biometrics

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***Abstract*** — This paper is about creating a unique identification number for individuals as their proof of living. The system uses biometric characteristics of an individual to create his/her unique identification number along with other essential details that needs to be present to withstand the living proof. At the time of enrollment, preprocessing for biometrics takes place in order to reduce delay in providing the unique id. The preprocessing phase is assisted with machine learning algorithm to find the uniqueness in each individual. The output of this system is QR code which is generated with hash value of the unique identification number in order to prevent visual representation of the unique id and to improve the efficiency in improving the response and result. The advantage is that the masking of unique id which makes it secure enough to avoid primary levels of threat.

***Keywords:*** Feature Extraction, Facial landmarks, Biometrics, Unique ID, Minutiae

## I.INTRODUCTION

India is a country with second largest population next to China .In this vast country providing security for each and every citizen is quite tedious task. Identification system was introduced by the government of India to define identity for people of the country. This system contains every information about people from their fundamental to biometrics details. It is used by various departments of the government to monitor the people activities and can have a trace of their routine. The technological concept that helps in the managing system is big data as the data generated from India is larger when compared to other countries. But this identification system was difficult to manage as the scalability increases and has several fraud attacks due to some insecure measures.

## II. EXISTING SYSTEM

In India people use their voter id, pan card, driving license as identity proof. But these proofs have specific purpose such as Voter Id is used for the purpose of voting on election, driving license is used for eligibility to drive and Pan Card is used for Tax and transaction purpose. Aadhaar Card is the only proof that specifies the identification of the person. But these Identification systems are dependent on the government officials rather than the data. Data of the person is the most important part, must be reliable and need to be secured. Usually the identification systems uses the N-digit random number and these random numbers are easy to exploit and some third party agents can misuse with the other persons details such as mobile number, bank details, etc.

TEAM NO : 15

# Preserving Privacy In Online Data Publishing

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***Abstract*** — This project is about conducting examinations in a secure way to avoid leakage of question papers. Our Technology can help to eliminate issue of question paper leakage. Question paper would be delivered to the respective examination location in digital encrypted format along with secure locking. Examination paper can be downloaded at exam center 10 minutes prior to examination start time. It eliminates logistical cost of transporting question paper to examination location in secure environment. First the examination board encrypts ten question papers using AES algorithm with different keys. Then they put the ten keys in a single encrypted file and send that to the examination centers with the decryption key. Then at the examination centers random selection for the key is made and the selected key is sent to all the registered candidates. Using that key candidates can request the examination board for the question paper at the time of examination.

***Keywords:*** Exam Confidentiality, Digital Question Paper, Secure Delivery, Cost Effective Exams.

## I.INTRODUCTION

The examination bodies put in a great amount of efforts to get the entire exam process get going. The examination board has to bear a big amount of loss in case a question paper is leaked. The examination board faces lot of issues due to the leakage of question papers. The leakage may lead to the examination being postponed or cancelled completely. In either of the cases, the loss will be beared by the examination body. The complete procedure of the exam is prepared and planned months before. Any last moment misconduct like the leakage of the question paper spills water on the months of efforts put in by the board.

## II. EXISTING SYSTEM

Defining Examination paper according to syllabus and delivering printed question paper at multiple examination center has been huge task of administration and logistics. Question Bank is maintained in multiple formats including documents, texts, notes, excel. Single source of managing question bank for particular subject topic is missing in the current context.

Examination paper setters need to travel to university location to define question papers. Entire process is manual. Examiners need to define questions according to exam pattern.

As there is no standard way of maintaining question bank, time required to define question paper can be higher to extent of defining questions in the initial stages. Moderator need to verify question sets defined by the paper setters. There is possibility of errors due to manual process. One of the question paper is selected as final question paper for respective examination and it is then sent to printing at secure location. Printed Examination papers needs to be sent at each examination center on examination date.

During each process there is manual intervention and possibility of leakage of question paper to outside world increases. Technology can help to simplify this process up-to great extent.

There is no guarantee that the paper is secure they might be leaked.

International Journal of Computer Trends and Technology (IJCTT) – Volume X Issue Y March 2019

# A SURVEY ON ORGANISATIONAL SUPPLY CHAIN PERFORMANCE MEASUREMENT

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*Abstract— A supply chain is the network of businesses and people that work together to move raw materials into finished goods and eventually to the end-user. In an industry which employs supply chain management, it is difficult for every single person to be involved manually. Hence in this day and age it is essential for the stakeholder's daily tasks to be automated. By this paper, we investigate several reputed articles to provide a better judgement on the management on performance in supply chain.*

**Keywords—supply chain management; performance measurement; scorecard; industries.**

## I. INTRODUCTION

Supply chain management involves a wide range of activities required to plan, control and execute a product's flow, from acquiring raw materials and production through distribution to the final customer, in the most streamlined and cost-effective way possible. For large complex supply chain networks, performance measurement is an important aspect to be considered. To use suitable supply chain performance systems and tools in industries, it is mandatory to clearly understand the current supply chain measurement system and performance processes. Performance measurement is critical to the success of any organization because it creates understanding, moulds behaviour and improves competitiveness [1]. Performance measurement provides the means by which a company can assess whether its supply chain has improved or degraded.

This paper is intended to provide a literature review on supply chain performance measurement. The review study covers articles coming from major journals related with the topic and explores more on the detailed methodologies that is provided in each article. This survey examines the solutions that have been explored in the past and provides a comprehensive study of the performance measurements used in the new supply chain era.

## II. LITERATURE REVIEW

The research of performance management has been popular for years. There were numerous publications emphasizing the need for relevant, balanced, strategic and improvement-oriented performance measurement systems [2].

In an article [3] on the supply chain performance by Kuhner, he begins his views on the performance measurement with the necessary requirements needed for a supply chain-oriented analysis. In the paper, the authors evaluate the performance with the help of 3 phases: Identification of goals, measurement of performance and the future work that can be developed in the performance measurement. In the identification phase, the customer-supplier relationships are studied exclusively. The measurement phase includes crucial activities such as to monitor, control and direct certain logistic activities. Here, the authors use the analogy of the balanced scorecard approach. Using this approach, the enterprise business is categorized as 4 different perspectives: financial perspective, customer perspective, internal business perspective and learning and growth perspective.

The financial goals of an organization mainly include improving profits, increasing the revenue and cost reduction [4]. The inspection of potential customers, what they need, how to achieve customer satisfaction is dealt with in the customer perspective [4]. The internal business perspective deals with improving the existing business systems by implementing new business strategies [4]. The learning and growth perspective are applied in the final phase and aims at providing a continuous improvement in the industry's performance.

The table below represents the various supply chain measures and the techniques used by them in detail.

# Static Code Analysis and Taint Checking to Avert SQL Injection and Cross Site Scripting

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***Abstract*—. The popularity of web applications is increasing to a greater extent in today's world. From a simple application consisting of text and images to complex applications such as a banking or a shopping application, web applications play a vital role for the concerned organization. The more the functionalities included in an application the more the application is subjected to *vulnerability*. *Common vulnerabilities include SQL* Injection and Cross-site Scripting. The web application must be coded in such a manner to prevent these vulnerabilities. The efficient method to analyze a code and detect for the presence of vulnerabilities is static code analysis which is done between the software development and testing phase. In addition to static code analysis taint *checking is also performed where the user given values to* the application are considered as tainted values, and they not inserted into the application without proper escaping or validation. The advantage of static code analysis is that all the lines in the application code are analyzed and taint checking does not include an non escaped user input. Thus, the application is protected from the vulnerability to a greater extent.**

*Index Terms*—**SQL Injection, Cross-site Scripting, Static code analysis, Taint Checking**

## I: INTRODUCTION.

*The increasing functionality of web applications is* increasing in the present era. Before 10 years people used web pages only for viewing information. Now web applications play an important part in our life. We can do activities such as paying electricity bills, booking railways and airline ticket, online transactions, shopping and so on. Everything is made online these days. We are entering sensitive information such as our credit card details case of online banking or any other important credentials the application specifies us to enter in its form. Any organization thus maintains its own web application for their business needs and maintains databases to store the details it gets from its users. However these applications when not properly coded can lead to vulnerability which may give an attacker to view the details inside the application, modify it and also can insert malicious scripts inside the application. The common vulnerability includes SQL injection and Cross-site Scripting. Both SQL Injection and Cross-Site Scripting are present in the OWASP Top 10 application security risks and still exist in most of the applications. The main reason for the presence of these vulnerabilities is that user's input are directly used in applications without proper validation or encoding. Applications must be coded in such a way to check and prevent these vulnerabilities. The two types of code analysis to check whether the application's code is immune to these vulnerabilities are dynamic and static code analysis. The cost of testing the application for vulnerability increases along the Software Development Life Cycle. Since static analysis is done between coding and testing phase and dynamic analysis is done during testing phase, static analysis provides cost- efficient and better code coverage than dynamic analysis.

## II: CONCEPTS INVLOVED

### *A. SQL INJECTION*

SQL injection is injecting the SQL query via the input data from client to the application. A successful SQL injection attack can retrieve, alter or delete the contents in the database.

**Example:**

An application directly uses a suspicious user input directly in a query. It consists of an admin login page where a successful login will give the admin access to all the user's details.

The login page prompts for the name and password and the SQL statement for comparing the user given details with the value in the database is:

String query="select * from admin where name='"+**admin**+"'and password='"+**password**+"'";

(18)

# Authentication by Encrypted Negative Password for an Intuitive Stock Management System

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***Abstract*** *—This paper is about securing the passwords and making the system more secured from intruders. Most of the stock management systems uses the method where in the passwords are just encrypted and are not secured properly. This encrypted negative password system uses the technique where in the passwords are first hashed and then converted to negative password and finally encrypted and stored in the database.However the processor resources and storage resources are becoming more and more abundant, hashed passwords cannot resist precomputation attacks, such as rainbow table attack and lookup table attack. This Encrypted Negative Password system still can resist the precomputation attacks. Thus by securing the pages with negative password system, all these vulnerabilities can be reduced.*

***Keywords*** *—Authentication, negative table, lookup table attack*

## I.INTRODUCTION

The stock management systems generally consist of all the stocks which are managed by the stores and quality department of the company. These stocks may be raw materials or finished products and these are valuable information which is needed to be secured properly. Most of these data's need to be secured as they should not be available to the other department. These information should be unknown and must not be disclosed to others and thus instead of using just plain passwords we can use the encrypted negative password system.

## II. EXISTING SYSTEM

The existing system actually uses the simplest mechanism of all the other techniques. The plain password is just encrypted and stored in the database. This mechanism is highly insecure and you can also find that it is easy to attack and get the password. The other main mechanism which is used till date is the hashing mechanism where in the plain password is hashed using hashing algorithms such as the Secure Hash Algorithm or the Message Digest Algorithm. Comparing to the previous mechanism it provides more security and also it doesn't provide the actual password but the hashed value of the password. But the plain password can be from the hashed value from the rainbow table attack and lookup table attack. Thus to reduce the vulnerability and risk we are using the Encrypted Negative Password System for the Stock Management system.

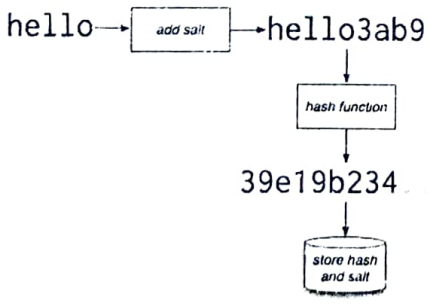


Fig.1 Salted Password

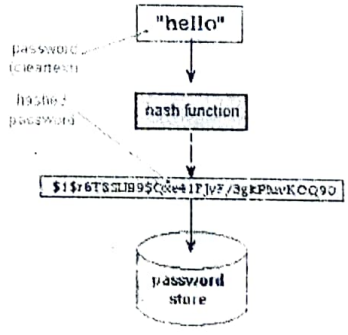


Fig.2 Normal Hash Password

# A Unified Approach for Finding Optimal Route Using User's Preferences

K.Priyadharshini, S.Usha, N.Pavithra and P.Revathi

***Abstract***---*With the advent of technology, our dependence on location based search is increasing day by day. In our existing search process, the application will fetch various routes for the given destination with the help of user's location and it will display them in random manner. But this method fails when the user does not know the exact address of the destination. For example, the user goes to the unknown location, he does not know the exact address of the destination but still knows the point of interest like hospitals, restaurants etc...In our proposed system, it will overcome the drawbacks of the existing system by simply giving query as various point of interest like hospitals, restaurantsetc. without mentioning the exact address of the point of interest. In this proposed system, theuser has the ability to select in which order the point of interest will be displayed i.e. either by nearest location based or based on the rating of the destination location.*

***Keywords***---*Accuracy, Data mining, location based search services, location data quality, Rating based service, nearest location based search services.*

## I. INTRODUCTION

WITH the emergence of technology, identifying the advantageous routes in a road network is the important problem. The existing system will offer different routes for particular destination or point of interest. But it will not address the issue of different destination for the particular point of interest. That point of interest may be hospitals, restaurants. and petrol bunks etc...

Consider a user who visits an unknown location, he does not know anything about that location but wants to explore the city. He just wants to visit the restaurants but he does not know what all the restaurants in that city are and which restaurant is nearer to him and which restaurant is better. At this time, our existing system will not address this issue. Our existing system will fetch different destination of the particular point of interest but does not give the destination which is nearer to the user and also fails to address which destination has the best user's rating.

The above given example has three important constraints: 1) the point of interest given by the user as the keyword for the query (restaurants, hospitals, petrol bunks etc.) as in [2].2) The preference of the user by the nearest location based on the user's current location 3) the preference of the user by the rating of the destination.

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## II. EXISTING SYSTEM

The existing system solves the problem in two cases: 1) the process of finding the routes for given destination (i.e. it will show the various routes for particular destination this case exists when the user knows the exact destination.)2)The next case is when the user does not know the exact destination but simply knows the point of interest like hospitals ,hotels ,restaurants etc...The above two cases can be described below.

**Case 1**: When the user knows the exact destination address, then the available location search services provides the n number of possible routes for the given destination .This is one of the location based search service.

**Case 2:** When the user does not know the exact location of the destination but knows only about the point of interest like hotel, restaurant mallsetc. The existing system will fetch the location according to the point of interest given by the user.

### *A. Drawbacks of Existing System*

- The existing system will give only the relevant location according to the user query but not exactly the location which is nearer to the user.
- The existing system does not consider the user's rating of the particular destination rather it displays the entire destination which are relevant to the particular point of interest given by the user.

## III. PROPOSED SYSTEM

In the proposed system, the above drawbacks of the existing system canbe resolved. The proposed system works in the situation where user does not know anything about the location this happens when the user visits unknown location. The user does not know the exact address of the destination but the user wants to visit the point of interest. The proposed system will get the current location of the user with the help of latitude and longitude of the device .This system will fetch the various location of the point of interest from the database by considering the latitude and longitude of the current user.

The proposed system will consider the various destinations which are nearer to the current location of the user. The proposed system will have the two options either it will display the various destinations in the order which is nearer

ISBN: 978-81-935422-9-7

TEAM 21

# A COGNITIVE ASSISTING SYSTEM FOR DEMENTIA PATIENTS

## USING ADVANCED MACHINE LEARNING TECHNIQUES


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*Abstract*: **Daunting forgetfulness, frequent distress in recognizing people and objects, inability to process and remember minutiae are excruciating tasks for most dementia affected patients. According to the WHO currently, there are more than 50 million adults suffering from dementia. It is estimated by WHO that by 2030 there will be around 82 million dementia affected people. Dementia affects the brain of the patients by damaging the brain cells in parts of the brain leading to different levels of dementia. The degree or level of dementia depends on the level to which the portions of the brain are affected. Hippocampus is the region of the brain responsible for learning and cognition and is severely affected by the onset of dementia. Loss of memory is a consequence of this effect. The objective of this paper is to introduce an integrated system to assist and alleviate the pain of patients with dementia (CDR Rating 0.1-0.5) by helping them with everyday tasks. This assistant aims to improve the quality of life of patients' increases by reducing their dependency on the people around them.**



***Keywords—Dementia, Assistant, Alzheimer***


### I. INTRODUCTION

In the past decade, there has been a tremendous growth in the field of machine learning and image recognition which has led to several advancements in every industry. This paper aims to use state-of-the-art machine learning algorithms to provide an assisting system for dementia affected patients. Face Recognition, Object Recognition and Voice Based Assisting System are the main features provided by the system to the patient to assist them in cognitive tasks involved in everyday life. Moreover, a GPS based tracking system and weekly charts of activities are also used to monitor the patient.

The assistant is designed to suit the needs of the patients three-fold. (1)Patients with dementia probably remember their close relatives and friends. However, they might not be able to relate their face to their name/identity. This assistant involves a two level neural network approach*based on facenet* to recognize faces. The training process involves a one-shot model and is very easy to use. (2)The assistant helps people identify daily objects by providing live object detection.(3)It also helps them with mundane jobs like searching for information on the web, sports, weather. It also delves into the possibility of creating a GPS based location tracking system, charts to handle everyday data and a comprehensive, user friendly interface.

### II. LITERARY REVIEW

#### *A. Impaired Facial Recognition Memory in Dementia*

A study was conducted with dementia patients of different stages to analyze their ability to recognize faces. Repeated set of faces were used the purpose. When a signal detection analysis was performed, it revealed that dementia affected patients are quite unable to differentiate new and old faces

#### *B. Association and Recognition for Novel Objects*

This is based on a study done to analyze object recognition capability and object-location pair coordination in the subjects. Although this study tries to differentiate the type of Alzheimer's based on episodic memory which is beyond the scope of this paper, it implies that severe difficulties are faced by patients with dementia in recognizing objects.

#### *C. An Analysis of the Viola-Jones Face Detection Algorithm*

It involves a scalar product between the image and Haar-like features.The cores of the Viola-Jones algorithm rests in the decision stump function which is a decision tree by structure. It involves the use of

TEAM : 22

# Arduino and NodeMcu based Ingenious Household Objects Monitoring and Control Environment

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***Abstract* — With the advent of innovation and automation, convenience and simplicity has permeated all walks of life. Home automation is one such emerging technology which empowers the residents to have wireless, ubiquitous and computerized control over the household gadgets. Some popular ways to implement wireless connectivity amongst the connected devices are cellular networks, IR sensors, Bluetooth, ZigBee frameworks and Wi-Fi networks with each type having its intrinsic strengths and setbacks. There are a plethora of IoT setups available but most of them have restricted compatibility and are tailor-made for manufacturer supported devices. In order to overcome these difficulties and provide a cost efficient solution, a generic, all product supporting Wi-Fi based remote home automation scheme using an Arduino UNO (microcontroller), an 8 channel Relay module and a NodeMcu (Wi-Fi module) is proposed in this paper. Naive users are familiar with Wi-Fi as it is already used in consumer electronics sector. They can utilise their existing hotspots with minimal additional infrastructure for new IoT applications. Therefore, a Wi-Fi based system brings down the cost by eliminating the need to buy expensive auxiliaries. Being compatible with the Internet Protocol (IP), a significantly higher number of devices can be connected to the internet when Wi-Fi is used. Firebase functions as the cloud hosted real-time database assisting data exchange and synchronisation. The connected devices are monitored and controlled through a mobile application from anywhere across the globe. Additionally, voice based control can be provided with the integration of Google Assistant. The device statistics are visually presented as charts to provide the users an overview of their usage.**

***Keywords* — *Internet of Things (IoT), Home Automation, Arduino, NodeMcu, Mobile App, Firebase.***

## I. INTRODUCTION

The Internet of things (IoT) is an emerging technological paradigm where the devices of everyday use are networked together. This includes mobile phones, refrigerators, washing machines, Television, lamps, watches, wearable devices and almost everything one can imagine. Even traditionally dumb devices can work in perfect synchronisation and interact with each other. The networked devices can identify themselves to other devices. These devices can exchange data through light weight protocols like MQTT, CoAP etc. IoT is seen as the next great revolution in technology which has the enormous potential to transform the way we live, think and act. Nowadays, it has expanded itself to cover almost all aspects of humaninterests. These devices can be remotely monitored and controlled from any corner of the world to perform the designated tasks. This has a huge scope to be scaled up and in future any device having an ON/OFF switch control has a chance to become a part of the IoT.

The connected devices can be assigned an IP address. With Internet Protocol Version 6 (IPv6), assigning an IP address to billions of devices has become very much feasible. Wi-Fi permits a significantly higher number of devices to be connected to the internet as it enjoys a natural compatibility with the Internet Protocol (IP). Wi-Fi also predominates in consumer electronics segment and enjoys a high degree of popularity [1].

There is no dearth of opportunities for smart homed IoT appliances as home automation seems to be imminent in near future. The principal advantage of such homes is amenity and contentment as it emancipates the dweller to perform other jobs. Smart homed IoT devices can help to cut costs and conserve energy. It can also be a blessing to the sick, elderly and all those requiring assisted living. From smart homes, the next improvement is smart cities, which would take the standard of living of its inhabitants to a higher standing.

The rest of the paper is organised as follows: Section II reviews related literature and briefs the methodology proposed in them together with their pros and cons. Section III provides the motivation for pursuing the work and reasons the chosen method. Section IV provides an overview of the components used, their functionality, the architecture of the proposed prototype and its implementation. Section V explains the various performance metrics considered for evaluation. Finally concluding remarks and possible future enhancements are listed in Section VI.

## II. LITERATURE REVIEW

In [2], Manda et al. proposed a prototype in which the appliances are physically connected to a 4 channel Relay module. This is in turn cabled with a LPC11U24 (ARM mbed microcontroller) which is interfaced with a SIM 300 (GSM module) to enable wireless cellular connectivity. Through the registered mobile number the user sends an SMS to the GSM module with codified phrases to turn ON/OFF the household appliances. While GSM provides security, this system lags due to the lack of a user interface and suffers from coverage issues.

Team 23

# An Automated Secure Voting System for Digital India

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***Abstract*** **— Digital India aims at empowering our country digitally in the field of technology. In the era of secured transactions from banking to smart ration cards, it is time to use technology for voting system to make it automated and secured. In this paper, an automated secure voting system using biometrics is proposed. This system is used to authenticate the voter and prevent fake votes. The iris and fingerprint data are used to authenticate the voter using image processing techniques. The ultrasonic sensors are used for fingerprint recognition. The contact details like mobile number and mail id of the voter are verified. The automated voting system ensures authentication of the voter and confidentiality of the vote casted using Advanced Encryption Standard. The authentication technique will help the migrants also to vote. Vote revocation can also be done in case of any discrepancy.**

***Keywords—Automated Voting System, Biometrics, Ultrasonic sensors, Image processing, Advanced Encryption Standard.***

## I.INTRODUCTION

Elections in the Indian constitution comprises of elections for the Parliament, RajyaSabha, LokSabha, the Legislative Assemblies, and numerous other Councils and local bodies. The Election Commission of India is an autonomous entity prescribed in the Constitution of India [1]. It is the federal authority responsible for administering all the electoral processes of India and ensuring that the election processes are conducted in a free and fair mannerThe Electronic Voting Machines (EVM) are presently used for the elections in India. The paper ballot vote was replaced by EVM from 1999 in some part of elections and completely after 2014 in all general state elections in India [2]. Figure 1 presents the Electronic voting machine.

In this paper, an automated secure voting system using biometrics is proposed. This system is used to authenticate the voter and ensure valid votes. The iris and fingerprint data are used to authenticate the voter using image processing techniques. The automated voting system ensures authentication of the voter and confidentiality of the vote casted using Advanced Encryption Standard.

Figure 1. Electronic Voting Machine
(Source: www.indiatvnews.com)

The rest of the paper is organized as follows. Section II describes with the existing EVM system. Section III presents the related technologies to be applied in the proposed automated secure voting system. Section IV presents the working of the proposed automated secure voting system. Section V presents the concluding remarks and the future enhancements.

## II.EXISTING EVM SYSTEM

An EVM comprises of a control unit, and the balloting unit. The five meter cable is used to join the two units of electronic voting machine. The voting counts and the results are displayed on 7th segment LED displays. The controller used in EVMs has its functioning program etched eternally in silicon at the time of manufacturing by the manufacturer. No one (including the producer) can change the program once the controller is factory-made [2].

TEAM 24



# PERFORMANCE MONITORING SYSTEM FOR VIRTUAL MACHINES

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***Abstract*- Various virtualization technologies are adopted to reduce the cost while maximizing the productivity, flexibility, responsiveness, and efficiency. In this paper a virtual environment is proposed where there are multiple virtual machines including several virtual clients and a single virtual server. The virtual clients are monitored by a centralized server. A machine's resource utilization depends on the applications that are running on it. Thus the system metrics indicate the excessive use of a machine. Processor performance, memory utilization and network properties are fetched from the client and communicated to the server machine using ZeroMQ, a message queuing technique. ZeroMQ is an asynchronous messaging library where the API provides sockets for communication. This data that is received by the server is logged and evaluated. If certain resource utilization exceeds a threshold, an email notification is triggered. This system provides a highly secure and efficient environment with limited memory overhead. It is especially useful for applications such as military and medicine where confidentiality is a prime concern.**

***Keywords*- virtualization, virtual machine, message queues, performance monitoring, ZeroMQ**

## I. INTRODUCTION

Virtualization is the foundation of cloud computing. The hypervisor is a program that enables hosting of several virtual machine on a single hardware. It divides the hardware resources across the various virtual machines. By separating the operating system and the applications from the underlying physical hardware, it is able to provide advantages like ease of deployment, ease of management, reduced cost, portability and optimal utilization of resources. However, it is prone to risks such as virtual machine failure, virtual machine separation and other kinds of issues. To protect the VMs in an efficient way, a monitoring system was first proposed by Jiangyong Shi , where the virtual machines memory, network and file systems were monitored. By assigning higher privileges to a single centralized virtual machine, the various performance metrics of the virtual machines may be gathered and monitored. The performance of virtual machines memory, processor and network are monitored. In the first part of the paper the methodology for gathering this data is discussed. Message queues are used for communicating performance data. The details are discussed in the second part of the paper. This communicated data are stored in the central server for analysis. The monitored results are shown in the third part of the paper. Additionally, an environment which makes use of this monitored data is proposed.

## II. RELATED WORK

Jiangyong Shi provided an introspection based virtual machine monitoring system that used the VMI technology to monitor the virtual machine one the hypervisor layer. The semantic information was analysed for intrusion using software tools like Snort, OSSEC and Volatility. The VM's memory, file system and network semantics were monitored. However, the passive technique is vulnerable to transient attacks.

Kenichi Kourai compared the performance of the virtual machine with that of the physical machine and provided methods by which the virtual machine could perform better than the physical machine. Though performance enhancement methods were provided, they were only applicable for certain configurations of the virtual machines and worsened the performance for other setups.

Hafiz ur Rahman monitored the virtual machine's performance by applying complex and heavy workload.

# Sensor Based Accident Prevention and Detection using Raspberry Pi

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**Abstract**— Accident rates are increasing and the reason behind them are various. Targeting the reason behind it at the initial stage will help reduce the number of accidents and its severity drastically. There is a lot of life loss after accidents due to no immediate medical attention.The project focuses on detecting one of the root causes of accident which is wheel alignment.Also accident is detected using a vibration sensor and the nearby hospital and family member is alerted which increases the chances of saving the life.

**Index Terms**— 3-Axis Accelerometer, Camber Angle, Latitudinal and Longitudinal points, Wheel Misalignment, Vibration Sensor

## 1 Introduction

THIS project focuses on detecting one of the root causes of accident which is wheel misalignment. Camber angle inspection plays a crucial role in vehicle safety and ensures the tyre quality. It influences the cornering force while driving and also road handling while driving. Camber angle affects steering controllability and stability while driving. Here we calculate the camber angle using the 3-axis accelerometer which gives the coordinate axes values.If the z-axis value does not fall under the given level, a message is sent to the mechanic nearby and also to a person the user has chosen. The user is also alerted to drive carefully.The next scenario where the project focuses is after the user has met with an accident. To avoid life loss and to provide immediate medical support, a vibration sensor is used which detects the magnitude level of the moving vehicle.Once the magnitude exceeds a certain level which is at a higher level,the user is alerted along with a set of people the user has chosen through SMS. The location is shared with them as Latitudinal and Longitudinal points by which they can get to know the exact location of the place the accident happened. This is all done with the help of a GSM module. By this,the chances of an accident happening could be sensed before so that the user could be more careful and alert while driving which could drastically reduce the chances of an accident happening. Also,if an accident occurs too, the chances of saving the life is high by providing immediate medical support.

## 2 Camber Angle

### 2.1 Camber Angle Inspection

Vehicle safety and quality are crucial to both manufacturing and maintenance in the automotive industry. Vehicle wheel alignments become essential since the wheel camber angle affects steering controllability and stabllity. Misalignments of wheels may effectuate rapid and irregular tire wear. In addition,they may decrease the capability of the vehicle's handling and safety. The camber angle is defined as the angle between the normal vector of the tire plane and that of the vertical plane viewed from the front of a vehicle. The camber angle has a major influence on the cornering force and on the road handling of the vehicle and therefore plays one of the most significant roles in vehicle handling and safety.

### 2.2 Camber angle Measurement

An approach is being proposed for performing Camber angle measurement based on a Micro-Control Unit (MCU). Two main components have been employed:the MCU and the 3-axis accelerometer. The MCU-based approach makes use of the 3-axis accelerometer to acquire gravity, and applies the coordinate transformation between the camber inspection system and the vehicle. the wheel is not necessary since the misalignment angle for the camber inspection system can be compensated by the proposed approach autonomously. Furthermore, the axis misalignment of the accelerometer can also be redressed by an appropriate calibration procedure to increase measurement precision. This paper also

# A SURVEY ON EXTENSIBLE FRAMEWORK FOR E-COMMERCE ON CUSTOMER RECOMMENDATION AND BARGAINING FOR PRODUCT MODIFICATION USING KNN ALGORITHM

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***Abstract*** — There are a lot of e-Commerce websites for retail selling of products. They display the products and their features along with photographs and videos with prices and allow the user or customer to choose the product pay for it using net-banking or choose 'Cash on Delivery' option.But there are no retailing websites which allow the customer to either bargain the prices or to suggest a remodelling or remanufacturing of the product. If the customer is a Business retailer or uses this product as a raw material for his end-product, requesting for a re-modelling and remanufacturing of the product is all the more important for him.The main aim of this paper is to overcome the limitations faced by the buyers in other Online shopping sites. The first approach is to build or form a group of consultants or agents who will be assigned proper shifts and will be paid accordingly. These consultants will be online representing the website by answering the queries raised by the customers and will also negotiate the prices according to each customer on a one to one business process. The second approach is modifying or altering the products according to the customers' perspectives and views but for this scenario the customer must mandatorily cart the product, only then the product will be altered. This will help to increase the number of buyers and retain the existing ones. The third and the final approach is the development of a facility to upload designs. This page is for the customers to upload their designs since there may be good designers but not good developers. Good designs will be selected, developed and sold online. A fixed percentage of profits obtained from the sale of the design will be provided to the designer. This paper proposes bargaining for online transaction or for online purchase of a particular product that plays an important role in the benefit of the online retailers and customer as well, keeping profit margin into consideration.

**Keywords—** e-Commerce , knn ,large data.

## I.INTRODUCTION

The domain touched by this paper is E-Commerce By Data Mining For Logistics, Erp And Cloud-Saas.

This web software is used for E-Retailing which is a customer facing e-Commerce portal used for show-casing products so that the customers choose the product they require order the quantity and pay for it.Data mining of historical purchase data can be used to predict price bargaining analytics. This needs organic growth of data while more and more customers continue to use the portal. This is a challenge during testing stage as enough volume of data cannot be obtained for testing. Only randomly generated data can be used during the testing stage as growth of volume is expected only after launching the product on the web.Logistics is part of the large ERP system connecting the

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# ADVERTISEMENT FEEDS BASED ON ONLINE USER'S MOOD ANALYSIS

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*Abstract*— **The main objective of this paper is to increase the buying percentage of the online users. By analysing one's state of mind and displaying relevant advertisements will increase their interest in the product and thereby increase the buying percentage of the product. Social Media is a platform where many individuals express their feelings through words. By analysing these text contents and using stemming process, relevant advertisements will be displayed on the screen. If the user shows interest in the advertisement they can click on it, which will take them to the relevant link of the advertisement. This technique increases the percentage of sales of the product by displaying the right advertisement to the right person. The results show that the buying percentage increases by a minimum of 20% using this technique.**

**Keywords: Social Media, Mood Analysis, Advertisements, Buying Percentage.**

## I. INTRODUCTION

Mental health [1] is a level of psychological well-being or absence of mental illness.The psychological state of someone who is functioning at a satisfactory level of emotional and behavioural adjustment is considered to be a person with a stable mental health. Mental Health Analysis is the process of breaking the mental issues or mental illness into smaller parts in order to gain a better understanding of it.A Human brain has seven moods between which it keeps switching according to the situation or the environment they are present in. Social media are interactive computer-mediated technologies that facilitate the creation and sharing of information, ideas, career interests and other forms of expression via virtual communities and networks. This is a paper that combines both mental health analysis and social media.

The technology used in the study is Stemming [2] technology. Stemming is a part of linguistic morphological which is used in reducing inflection. When an input data is entered by the user, the stemming process will take place between the tags provided for the advertisement and the keywords in the status. Accordingly the advertisement which relate to both the keyword and the tags are displayed on the screen for the easy access of the advertisement by the user.

The rest of the paper is organized as follows. Section II presents Literature Survey. Section III presents the proposed method. Section IV presents the system architecture. Section V presents the results and discussion. Section VI presents the concluding remarks.

## II. LITERATURE SURVEY

The literature survey is presented below in a table 1 with the methodologies and its pros and cons.

| METHODOLOGY | PROS | CONS |
|---|---|---|
| Deep convolution neural network [3] | F-1 measures for semantic classification | Cannot produce accuracy if it is not F-1 |
| Psychomotor symptoms. [4] | Measures severity of moods. | Used in depression detection. |
| Lexicon based [5] | Language style is used to determine the mood | Low recall and high dependency on the quality |
| Fuzzy based [6] | Obtains simple solution rather than statistical issues | Unable to determine sentiment polarity of some statements |
| OCR technique [7] | Categorizes and stores the data in clipboard | No fixed output |

Table 1. Literature Survey

## III.METHOD

The major requirements for this paper is a platform to enter an input data and to display the advertisements, which is considered more often for a social media platform. These social media platforms are created with the computer languages HTML,CSS and JAVA. The usage of SQL is used for the storing of the data entered by the users.

The advertisements produced are also stored in a database for the stemming algorithm to take place. Stemming algorithm or Stemming Process or Stemming technique is a process of reducing inflected or sometimes derived words to their word stem. There are several types of stemming algorithm but a traditional stemming algorithm is which that looks up the inflected form in a lookup table. The advantages of this approach are that it is simple, fast and easily handles

# DESIGN OF CONTROL SYSTEM FOR HIGH PRECISION FEED DRIVES OF MACHINE TOOLS

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**Abstract-Nowadays, high speed and high acceleration machine tools are used for industrial purposes for which the structural vibrations are obtained in huge amount which affects the precision of the feed drives. The feed drives are used to position the cutting tool and work piece to a desired location, hence the positioning accuracy and the speed determines the quality and productivity of the machine tool. To avoid such structural vibrations obtained in those machine tools and to increase the performance characteristics and to maintain a nominal precision for such machine tools our project deals with controlling of different electrical parameters.**

## I. INTRODUCTION

The main purpose of this project is to attain a nominal precision in feed drives. The adoption of ball screw mechanism with a carriage mass with a supporting LM block which is driven by a motor from the electrical block is considered.

A ball screw is a mechanical linear actuator that translates a rotational motion to linear motion with little friction. A threaded shaft provides a helical raceway for ball bearings which acts as a precision screw. They are able to apply or withstand high thrust loads, they can do so with minimum internal friction.

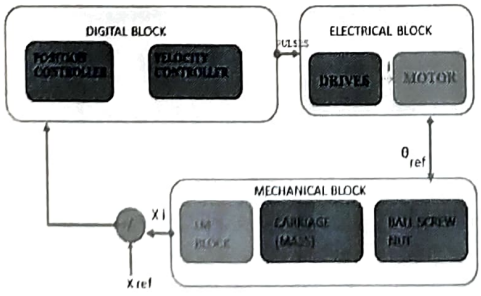


FIG 1 BASIC BLOCK DIAGRAM OF THE PROPOSED SYSTEM

They are made to close tolerances and are therefore suitable for use in situations in which high precision is necessary. The ball assembly acts as the nut while the threaded shaft is the screw. In contrast to conventional leadscrews, ball screws tend to be rather bulky, due to the need to have a mechanism to recirculate the balls. Therefore the amount of friction in the recirculation through balls technique is reduced.

The ball screw's input is given from the ac motor which is driven by a servo drive. The current from the servo drive is sent to the motor which is sufficient for the motor to operate whose output is a rotational reference angle that acts as the input for the ball screw. The ball screw converts the rotational force to linear force and moves the carriage mass on the ball screw in linear movement. The position and the velocity of the linear movement is the feedback controller that acts as the input for the digital block. The position controller and velocity controller filters the vibration and improves the precision of the system.

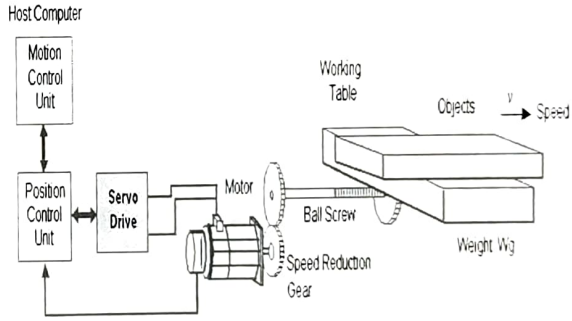


FIG.2: BALL SCREW MECHANISM

From the fig.2, the motion control unit is used to control the position of the ball screw movement. The servo drive drives the motor at very high speed which cannot be directly applied to ball screw. Hence an arrangement of speed reduction gear is made such the speed is reduced to a minimal value for the ball screw to function. The speed reduction gear reduces the speed nominally for the ball screw to operate. The feedback controller and feed frward controller plays the major part in maintaining stability of the system.

## II. CONTROLLER SYSTEM

Most mechatronic systems are actively controlled motion systems, which impliesthat these systems are of a dynamic nature. These dynamics deteriorate the pre-defined trajectory of the machine tool. Motion control is all about the control of amachine to follow a pre-defined trajectory in space and time, with

variousapplications.The feedback and feedforward control enable to realise a significant improvement inthedynamic performance of mechatronic motion systems. Feedback control allows tomodify the system properties by changing the pole locations of the system, thereforeoffering to control unstable systems and add robustness to the feedback controlledsystem. Feedforward control enables to improve the performance of motion systemfor instance by zero-pole cancellation, while not being limited by the conditions forstability and, in general, being simpler and faster than feedback control. With thecombination of both, feedforward and feedback control, also called two degree offreedom control, we can optimise the control design including the trade-off betweenperformance and robustness. The behaviour of the plant has to be known sufficientlywell, either by means of system identification or by modelling.

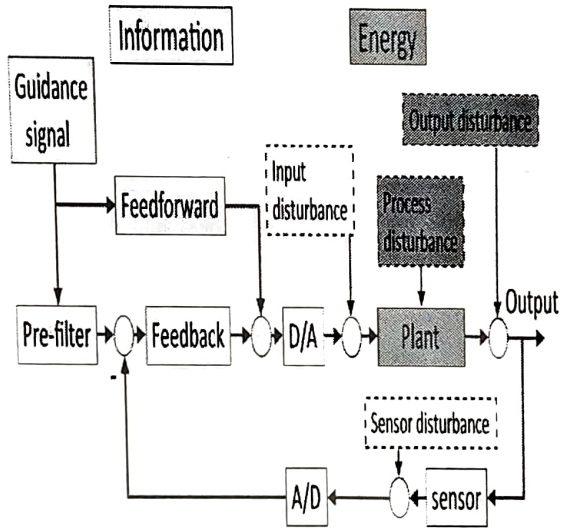


FIG.3 FEEDFORWARD AND FEEDBACK CONTROLLER

## III. FEEDFORWARD SYSTEM:

For open-loop stable system, it is possible to apply feedforwardcontrol to improve the system performance when following a pre-defined trajectory like a reference signal or a repeating scanning motion.

A feedforwardcontroller basically consists of a filter that is placed in series with the plant in order tocompensateits dynamics.The reference or guidance signal1 r is applied to the controller that has a frequencydependent transfer function Cff(s). The output u of the controller is connected to the input of the motion system that has a transfer function G(s) giving the output y, whichis a position.

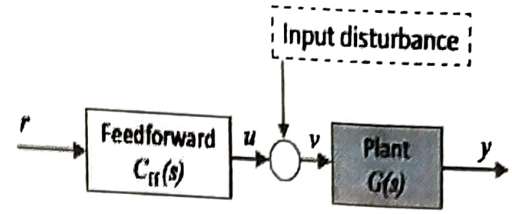


FIG.4: FEEDFORWARD CONTROLLER

In this configuration the feedforward controller acts as a filter thatmodifies the reference signal in such a way, that the motion of the controlledmechatronic system followsthe reference signal. If we want to achieve perfect control, which means that there isnodifference between the reference position and the actual position of the system, thecombined transfer function Gt,ff(s) from r to y has to be equal to one, hence showidentity:

$$G_{t,ff}(s) = y/r = C_{ff}(s)G(s) = 1$$

In that case the feedforward controller has to be the exact inverse of the plant

$$C_{ff}(s) = G(s)^{-1}$$

## IV. FEEDBACK CONTROLLER:

If no dynamics are involved, the feedforward controller eventually would only represent a gain that scales the reference signal. In reality positioning systems include dynamics with a frequency dependent transfer function. In that case also thedynamics of the positioning system have to be inverted, which results in pole-zerocancellation between the controller poles and system zeros as well as controllerzeros and system poles. The feedforward problem can be more complicated as notalways all plant dynamics can easily be inverted.

In feedback control the actual status of the motion system is monitoredby a sensor and the controller is generating a control action based on the difference between the desired motion (reference signal) and the actualsystem status (sensor signal). The outputy is measured and compared with(subtracted from) rf which is the reference r, after filtering. The result of thiscomparison is used as inputfor the feedback controller. Because the sensor signal is fed back in a closed-loop tothe input of the system, feedback control is also called closed-loop control.It shows both the fitted dynamic model of the scanning unit without control (solidline), the notch filter by the 3rd order feedforward controller (dashed line) and theresulting compensated dynamic performance of the combined scanning unit and controller (dashed-dotted line).

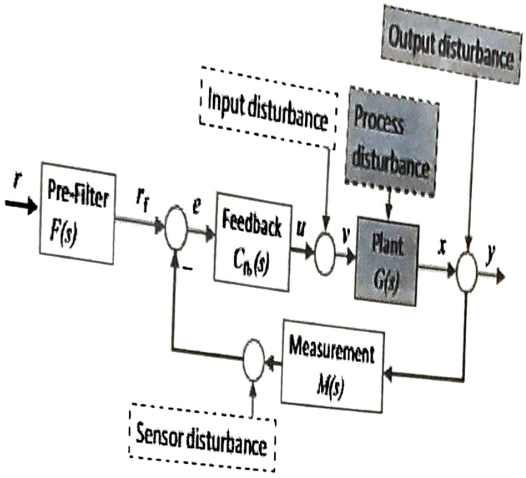


FIG.5: FEEDBACK CONTROLLER

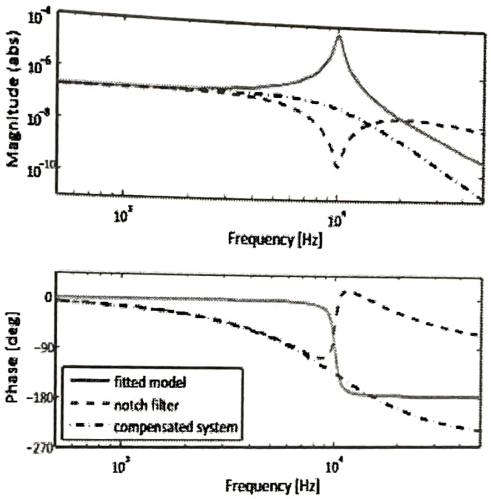


FIG.6: BODE PLOT OF FEED FORWARD CONTROL SYSTEM

## V. INPUT SHAPING:

Another open loop method that is often used I motion control is called as input shaping. With this method the reference signal is modified in a different way than by the linear filtering and compensation. When step signal is given to a system, it would start to oscillate at its natural frequency where he oscillation would fade away after the step according to the damping of this resonance. In a first approximation, the system can be assumed to behave like a linear system which means that a reduction of the input step stimulus by a factor of two would result in a reduction of the amplitude of the response by the same factor two. When these steps are applied with only half the height of the full step,the same steady state would be obtained in with the full step stimulus after all_oscillations are damped out. If one of these half-height steps is delayed by half the period of the system's resonance frequency, the oscillations that_are caused by each individual step are 180◦outofphase and cancel each other.

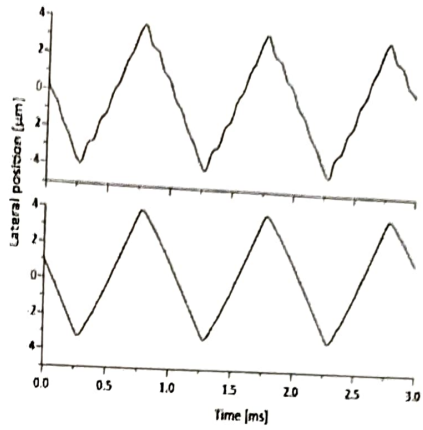


FIG.7: INPUT SHAPPED EXAMPLE OF A SYSTEM AFTER A APPLICATION OF POLE ZERO CANCELLATION

are caused by each individual step are 180◦outofphase and cancel each other.

This splitting of the reference signal into two equal signals and delaying one of them by half the period of the system's resonance is a typical example of input-shaping. This method clearly is very different from pole-zero cancellation as it is time domain instead of frequency domain based filtering. In the frequency domain these sampled adaptations to input create a frequency spectrum with a multiple of notch filters at the harmonics of the frequency that these adaptations are applied.

## VI. ADAPTIVE FEEDFORWARD CONTROL

The model based pole zero cancellation and the input shaping only work reliably as long as the dynamic properties of the total plants are known and they remain constant. These dynamics include the transfer functions of passive elements like the mechanics as well as active elements like amplifiers and actuators.In reality often external influences have an impact on these dynamic properties, leading to an increasing deviation between theparametersinthe modelandthereality. This deviation canbepartly solved by adaptive feedforward control, adapting the feedforward signal by measuring it sreal behaviour. This method equires a sensor toob tainin formation about the behaviour and for that reason it isoften applied in combination with feedback.

*A.P Controller*: P controller is mostly used in first order processes with single energy storage to stabilize theunstable process. The main usage of the P controller is to decrease the steady state error of thesystem. As the proportional gain factor K increases, the steady state error of the systemdecreases. However, despite the reduction, P

control can never manage to eliminate the steadystate error of the system. As we increase the proportional gain, it provides smaller amplitudeand phase margin, faster dynamics satisfying wider frequency band and larger sensitivity tothe noise. We can use this controller only when our system is tolerable to a constant steadystate error. In addition, it can be easily concluded that applying P controller decreases the risetime and after a certain value of reduction on the steady state error, increasing K only leads toovershoot of the system response. P control also causes oscillation if sufficiently aggressive inthe presence of lags and/or dead time. The more lags (higher order), the more problem itleads. Plus, it directly amplifies process noise.

*B.P-I Controller* :P-I controller is mainly used to eliminate the steady state error resulting from P controller.However, in terms of the speed of the response and overall stability of the system, it has anegative impact. This controller is mostly used in areas where speed of the system is not anissue. Since P-I controller has no ability to predict the future errors of the system it cannotdecrease the rise time and eliminate the oscillations. If applied, any amount of I guarantees setpoint overshoot.

*C.P-D Controller* :The aim of using P-D controller is to increase the stability of the system by improving controlsince it has an ability to predict the future error of the system response. In order to avoideffects ofthe sudden change in the value of the error signal, the derivative is taken from theoutput response of the system variable instead of the error signal. Therefore, D mode isdesigned to be proportional to the change of the output variable to prevent the sudden changesoccurring in the control output resulting from sudden changes in the error signal. In addition, D directly amplifies process noise therefore D-only control is not used.

*D.P-I-D Controller:*P-I-D controller has the optimum control dynamics including zero steady state error, fastresponse (short rise time), no oscillations and higher stability. The necessity of using aderivative gain component in addition to the PI controller is to eliminate the overshoot and theoscillations occurring in the output response of the system. One of the main advantages of theP-I-D controller is that it can be used with higher order processes including more than singleenergy storage.

## VII. SERVO DRIVES:

A servo drive is a special electronic amplifier that are usedto power the electric servo-mechanisms.A servo drive monitors the feedback signal from the servomechanism and continually adjusts for deviation from expected behaviour.A servo drive receives a command signal from a control system, amplifies the signal, and transmits electric current to a servo motor in order to produce motion proportional to the command signal. Typically, the command signal represents a desired velocity, but can also represent a desired torque or position. A sensor attached to the servo motor reports the motor's actual status back to the servo drive. The servo drive then compares the actual motor status with the commanded motor status. It then alters the voltage, frequency or pulse width to the motor so as to correct for any deviation from the commanded status. In a properly configured control system, the servo motor rotates at a velocity that very closely approximates the velocity signal being received by the servo drive from the control system. Several parameters, such as stiffness (also known as proportional gain), damping (also known as derivative gain), and feedback gain, can be adjusted to achieve this desired performance. The process of adjusting these parameters is called performancetuning.

## VIII. SERVO TUNING:

In the latest high-speed and high-acceleration NC machine tools, the structural vibration is one of the most critical factors to deteriorate the machine's contouring performance. Particularly on such a machine, the parameters in a CNC servo control system must be carefully tuned, since too high response of the latest CNC units often causes severe structural vibration.. In order to reduce the structural vibration with the minimum sacrifice of control bandwidth, the tuning is based on iterative measurement and simulation of the machine's contouring performance. A case study shows that a proper tuning of servo parameters significantly reduces the structural vibration and improves the machine's overall contouring accuracy.A structural vibration is also a critical issue on typical high-

speed machines. A high-speed, high-acceleration feed drive naturally imposes a severer impact force on the mechanical structure, which causes the structural vibration of lower frequency, and larger amplitude. This issue becomes more critical on a linear motor driven feed drive. Since it is a direct drive with no transmission mechanism, its driving force is directly transmitted to the mechanical structure. In today's market, the majority of servo motor driven feed drives in machining centres still adopts the "semi-closed loop" control (i.e. the angular position of a servo motor is feedbacked for the position control). On the other hand, a linear motor driven feed drive system must directly feedback the linear position of a table. Therefore, the dynamics of structural vibration directly affects the dynamics of the position closed-loop system. When servo parameters are not properly tuned, it may even cause the instability of the closed-loop system. The

structural vibration becomes particularly a critical issue on a large-size machine tool, where the mass of the driven part is generally heavier and/or the travel range is longer.

Conventionally, the gains of position and velocity controllers are set as high as possible, under the condition that the stability (and robustness) of the closedloop system is secured with some stability margins. On the latest high-speed machines, however, it is often the case that feedback gains must be lowered to reduce the motion error caused by the structural vibration. On some large-sized machines, the maximum acceleration is set lower than the potential capacity of a servo motor, in order to secure required motion accuracies.

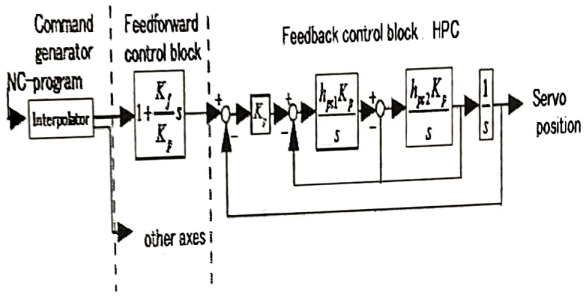


FIG.8: SIMPLIFIED CNC DYNAMIC FEED DRIIVE SYSTEM MODEL

Basically, the servo parameter tuning methodology is based on the measurement of the machine's two-dimensional contouring performance by using the cross grid encoder method, or the KGM (Kreuz Gitter Meβsystem in German) method, developed by Heidenhain GmbH. Since the KGM method is non-contact optical measurement, it is more suitable for high-speed and highaccuracy measurement. More importantly, unlike the DBB (Double Ball Bar) method that is restricted to a circular test, it can measure the machine's twodimensional contouring error on an arbitrary geometry.

## IX. CONSIDERATIONS FOR TUNING:

1.From the fig.8, the command generator is considered exactly same as the one used in the actual CNC unit. Most commercial CNC units in today's market support an S-curve velocity profile which can be represented by the combination of two filters and has two parameters to be tuned.Typical commercial CNC units employ two ways to distribute a velocity command profile to each axis; the pre-interpolation and post-interpolation acceleration controls. In the post-interpolation acceleration control, a velocity command is distributed to each axis and then is filtered independently. On the contrary, in the pre-interpolation acceleration control, it is first filtered and then distributed to each axis. The pre-interpolation acceleration control must be used for high-accuracy contouring.

2.A feedforward controller of the first order is assumed for faster response while securing the stability of the feedback loops.

3.The transfer function of the velocity and current control loop is regarded to be ideal since the bandwidth of these loop is general sufficiently large compared to that of the position loop.

4.Many commercial CNC units in today's market implement a higher-order position control loop block to improve the response of the closed-loop system. The radius reduction in circular interpolation can be improved by using a high order position control loop.

For tuning all the servo parameters the following parameters have to be controlled, 1) an acceleration time (the first-order time constant for linear acceleration and deceleration), 2) a position loop gain, p K , 3) a time constant of asmoothing filter on the reference trajectory, 4) a feedforward controller gain, f K , and 5) a corner velocity.

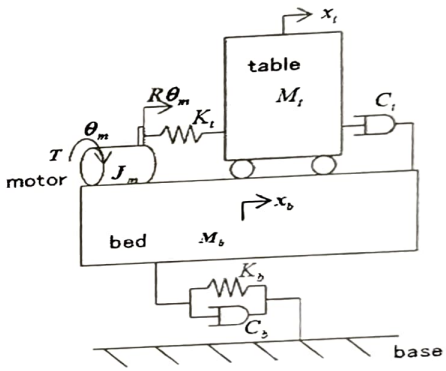


FIG.9: DYNAMIC MDEL OF FEED DRIVE SYSTEM

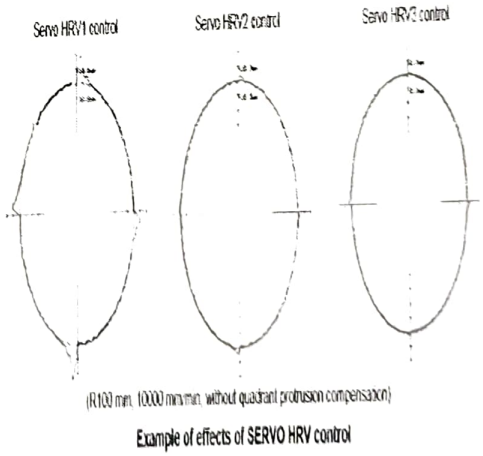


FIG 10: BY USING THE HIGH RESPONSE VELOCITY CONTROLLER I THE PROTRUSIONS ARE IDENTIFIED IN A CIRCULAR RADIUS WHEAREAS WITH HRV2 THE PROTRUSIONS ARE REDUCED TO MINIMUM AMOUNT AND WITH HRV3 THE PROTRUSIONS ARE TOTALLY NULLIFIED.

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# DEVELOPMENT OF IOT BASED SMART SECURITY AND MONITORING DEVICES FOR AGRICULTURE

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***Abstract*—The Internet of Things (IoT) technology is currently shaping different aspects of human life. Precision agriculture is one of the paradigms which can use the IoT advantages to optimize the production efficiency and uniformity across the agriculture fields, optimize the quality of the crops, and minimize the negative environmental impact. In this paper, we present an IoT architecture customized for precision agriculture applications. The proposed three-layer architecture collects the needed data and relays it to a cloud-based back-end where it is processed and analyzed. Feedback actions based on the analyzed data can be sent back to the front-end nodes. We built a prototype of the proposed architecture to demonstrate its performanceadvantages.**

***Keywords—Internet of Things (IoT); precision agriculture; sensor networks; platform implementation; cloud computing***

## I. INTRODUCTION

Precision agriculture emerged in the late 1980's with the matching of grid-based sampling of soil chemical properties with the newly developed variable-rate application equipment for fertilizers [1]. Since then, it became the main farming management practice worldwide. Precision agricultural services provide the means to (1) fight epidemic diseases by applying the appropriate types and amounts of fungicides, pesticides and organic fertilizers at the right times, (2) achieve efficient water consumption by watering the plants with only the needed amount of water and the right time, (3) reduce the harm to the environment since knowing when to spray a pesticide does not only lead to effectively killing harmful pests but also reduces the use of the pesticide, and (4) produce high-value agriculture productions by growing non-toxic, safe, and healthy crops.

The use of Wireless Sensor Networks (WSNs) in precision agriculture increases the efficiency, productivity and profitability of many agricultural production systems [2]-[11]. Real-time environmental information can be remotelygathered from the agricultural fields and transferred to where it can be processed to discover problems, store data, and/or take needed actions. This contrasts with the traditional agricultural approaches in which decisions are taken based on some hypotheticalaveragecondition,whichmaynotreflectreality.

WSNs are key components the Internet of Things (IoT) in which different pieces of information gathered from almost anywhere and anything in the world are accessible through the Internet. The integration of WSNs with IoT resulted in a plethoraofapplicationssuchassmart-cities,remotehealthcare, energy and water control, precision agriculture, wildlife monitoring,structuralandancientbuildingmonitoring,etc.

In this paper, we propose a cloud-based IoT architecture thatisapplicableindifferentprecisionagricultureapplications. The proposed architecture is composed of three layers: a front-end layer that collects the environmental information and applies the needed agriculture actions; a gateway layer that connects the front-end layer to the Internet, and a back-end layer in which the data storage and processing take place. A prototype of the proposed architecture is built and tested to illustrate itsperformance.

The remainder of the paper is organized as follows. In Section II, we review the related literature. The proposed IoTarchitecture is presented in Section III. A preliminary set of resultsofaprototypeofthisarchitectureispresentedinSection IV. The paper is concluded in SectionV.

## II. RELATEDWORK

### A. High-Level IoTArchitectures

This category represents the related IoT architectures that were proposed in the literature. A classification of generic IoT platforms is presented in [2], which also develops a top-level generic IoT architecture suited for smart city applications including precision agriculture. Likewise, [3] presents a functionalviewofanintegratedarchitectureofdataacquisition and intelligent control system that can be used in agricultural facilities such as greenhouse. In [4], the authors present a functional architecture that aims at promoting thedevelopment of facility habitat intelligence monitoring platforms. The authors of [5] integrate the recently developed Open IoT platform that is applicable in a number of use cases with the Digital Agriculture (Phenonet) to develop a semantically enhanced agriculture ontology. However, all such related works lack actualimplementations.

### B. Crop MonitoringPlatforms

Several IoT systems have been developed for monitoring purposes in precision agriculture application [6]-[8]. With the goal of increasing the crop production, a crop monitoring system was developed to collect the crop data and use production system through correlation analysis between the crop statistical information and agricultural environment information [9]. The platforms presented in [10] and [11] and control functionalities based on the monitored data

### C. *Irrigation ControlPlatforms*

Several IoT platforms have been recently developed to control the water consumption in irrigation. Examples include the simple system developed in [12]. More advanced systems such as the system presented in [13] which allow users to control the irrigation process via cellular technologies. Likewise, the system presented in [14] uses cellular technologies to transfer the sensors' data to a database system. The platform proposed in [15] directs the data to a cloud service through HTTP.

## III. PROPOSED CLOUD -BASED AGRICULTURALIOT ARCHITECTURE

The proposed cloud-based IoT architecture for agricultural applications depicted in Fig. 1 is composed of 3 layers: front-end, gateway, and cloud back-end. In this section, we discuss these three layers and their implementation in detail.

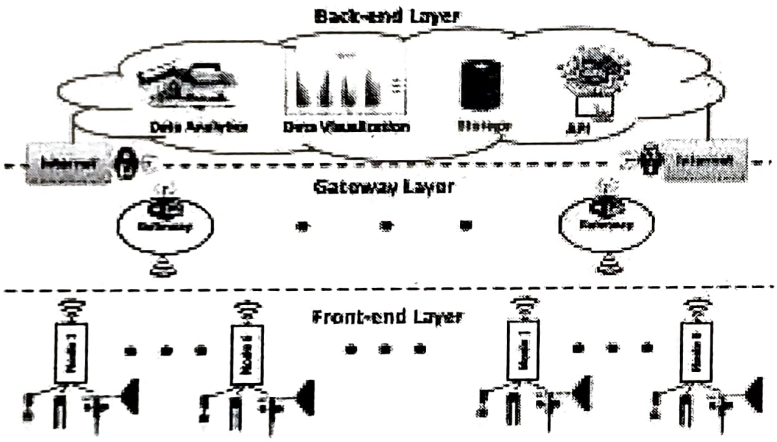


Fig. 1.Proposed cloud-based IoT architecture for agricultural applications.

### A. *Front-endLayer*

The front-end layer is the physical hardware or the sensing nodes that are composed of 4 modules: a microcontroller, the environmental sensors and actuators, interfacing circuits, and a wireless communication module as shown in Fig. 2.

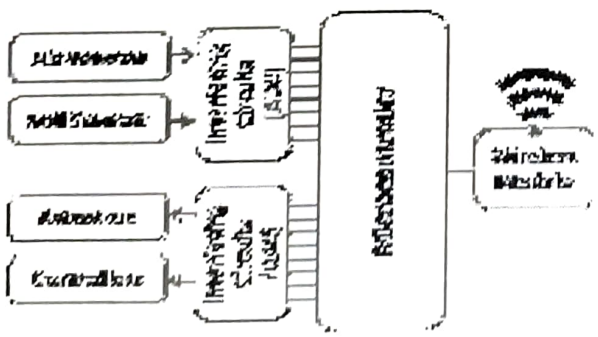

Fig. 2.Front-end node architecture.

**Microcontroller:** The microcontroller is responsible for collecting the data of the different sensors attached to it and communicating such data to the next layer of the architecture. Dependingontheapplication,themicrocontrollercanbeeither battery-powered,self-poweredusingsolarpanels,orself-powerwithbackupbatteries.WeusetheRaspberryPi2single-board microcontroller that is powered through a 3.7 V Li-Ion battery in our front-endnodes.

**Sensors and Actuators:** Different aboveground and underground sensors are used in precision agriculture to measure the different environmental attributes needed by a target application. Examples includes sensors that measure air temperature, air humidity, soil temperature, soil volumetric water content, wind speed, wind direction, rain meter, solar radiation (infrared, visible, and ultraviolet), and leaf wetness. These sensors collect the physical information to be communicated to the back-end server. Table I lists the sensors used in our node prototype. Based on the sensed information, the system is capable of taking the appropriate action such as spraying chemicals or fertilizers, watering the plants, etc. This is implemented through a set of actuators and mechanical controllers that are used to control pumps and sprayers. All communications between the microcontroller and the sensors/actuators are done using the I2C protocol.

TABLEI. USED SENSORS

| Sensor | Model |
|---|---|
| Air Temperature | SHT11 |
| Air Humidity | HTU21D |
| Soil Moisture Sensor | SEN0114 |
| Leaf Wetness | FC-37 |
| Wind Speed/Direction | SEN-08942 |
| Rain Volume | SEN-08942 |

**Interfacing Circuits:** The different sensors convert the sensed phenomena (e.g., temperature) into an equivalent electric voltage or current. However, such electric voltage or current is still in the analog format. A sensor interfacing circuitry is needed to convert such analog signals coming from the sensors into the corresponding digital format and perform any further signal conditioning functionality to ensure compatibility with the used microcontroller. Analog-to-Digital Converters (ADC) are the core component of such interfacing circuits. We use the 6-bit CA3306 CMOS parallel ADC designed for low-power applications. On the other hand, the actuators and mechanical controllers use analog signals as inputs. Therefore, interfacing circuits that convert the digital outputs of the microcontroller to the needed analog control signals are needed. Digital-to-Analog Converter (DAC) interfacing circuits are used for that purpose such as the low-power MCP4725 DAC used in our system.

**Wireless Communication Module:** The purpose of this module is to provide the sensor nodes with the means to communicate the data to the nearest gateway. Unlike the vast majority of related works which use the high power Bluetooth orcellulartechnologies,weusethenRF24L01ultra-low-power transceiver operating on the 2.4 GHz ISM band which significantlyreducesthepowerconsumptionofourdesign.

### B. *GatewayLayer*

The different front-end nodes deployed in the agricultural field collect the sensor data and relay it to a gateway. The

gateway then relays the collected data (possibly after manipulatingit)tothecloudserversintheback-endforstorage and extensive data analysis. The gateway layer also forwards requests from the back-end to the actuators in the nodes. Each gateway can be connected to up to 6 front-end nodes through nRF24L01 transceivers such as those used in the front-end nodes. The gateway is also implemented using Raspberry Pi 2 microcontroller. Being equipped with a 900 MHz quad-core ARM cortex-A7 CPU and 1 GB RAM, such a microcontroller provides the needed processing power and storage that ensure thatallthecapturesensordataisrelayedtothecloudserverfor analysis. A miniature IEEE 802.11b/g/n (WiFi) module isused to connect the gateway to the remote back-end. The used module is interfaced to the microcontroller using a standard TCP/IPinterface.Thedatarateofthismoduleis150Mbps.

### C. *Back-endLayer*

The back-end is responsible for facilitating the end-users' ability of accessing the sensed data. This is achieved by implementing several services including, but not limited to, data storage, data analytics, and data visualization in addition to providing an appropriate application program interface (API) and software tools through which the end-user can accessthedata.Inourproposedarchitecture,weimplementthe back-endlayerviathecloud-basedservershowninFig.3.

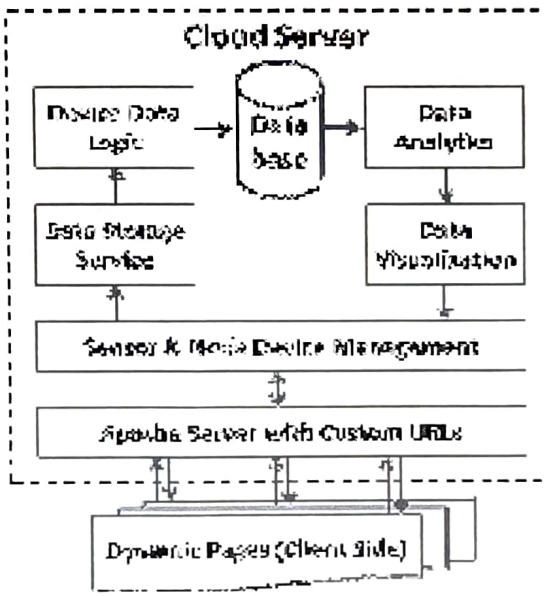


Fig. 3.Cloud server architecture.

The back-end cloud server has a large database at its core thatcanaccommodatehugeamountofdatarelayedthroughthe gateway layer from the front-end node. The database is interfaced to a wide set of data analysis algorithms and APIs such as Google Sheets for data visualization. Data can be accessed through the Internet using dynamic webpages as shown in Fig.3.

InourimplementationofthecloudserverbothApacheand MySQL run on the same virtual machine (VM) running Ubuntu 14.04. This VM is just one of the many VMs that constitute a larger VSphere implementation. The VSphere controlpanelisusedtoincreasetheresourceallocationofthe VM (such as memory and disk space) with a minimal downtimeandwithoutdatacorruption.Itisworthnotingthatif the agriculture system requirement exceeds the available hardware resources, the implemented VM can be easilymoved to a dedicated cloud hosting platform such as an EC2 instance on Amazon Web Services(AWS).

## IV. PROTOTYPE PERFORMANCEEVALUATION

A prototype of the proposed architecture for IoT precision agriculture applications has been implemented for a proof of concept to evaluate the proposed IoT transducer framework. Three front-end nodes equipped with sensors listed in Table I were used. These three front-end nodes are deployed outdoors in the Central Michigan University (CMU) campus. The nodes connect to a single gateway using nRF24L01 wireless interfaces. The gateway connects to the Internet, and hence to the back-end cloud server, using the WiFi technology. The gateway collects data from the three front-end nodes and performs abstract data analysis for immediate feedback (if necessary), and transmits the raw data to the cloud for detailed data analytics. The back-end cloud server receives and stores the data received from the cloud server, performs data analytics, and creates visual illustrations for easier data interpretation.

### A. *Wind Speed andDirction*

First, we collect the wind speed and direction data. For the wind speed data, the rotation of the sensor is converted into velocity measured in Miles Per Hour (MPH). The used SEN-08942 sensor gives different voltage values for different directions. The sensor used in the prototype gives up to 16 different directions. Fig. 4 depicts the wind speed collected over a 200 minutes window. This figure shows the variations of the wind speed by the minute over the observation window. Different granularities can be obtained using our cloud server. Weomitthewinddirectionresultsforspaceconsiderations.

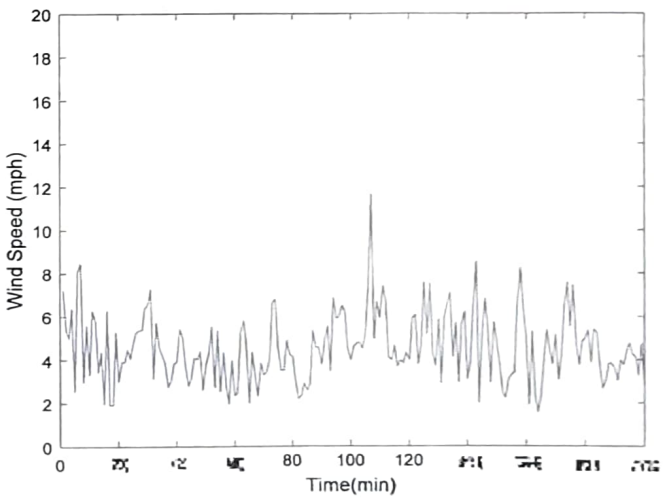


Fig. 4. Wind speed recorderd over a 20 minute window.

### B. *RainVolum*

Next, we present the results of the rain meter and the moisture sensors. We show such data in Fig. 5 for a 200 minutes window in which the rain existed only in the first 23

minutes. Fig. 5 shows the gradual decrease in the rain volume before it stops. Meanwhile, the moisture slightly increased after the rain stopped. Such data can be used in predicting the evolution of plan diseases.

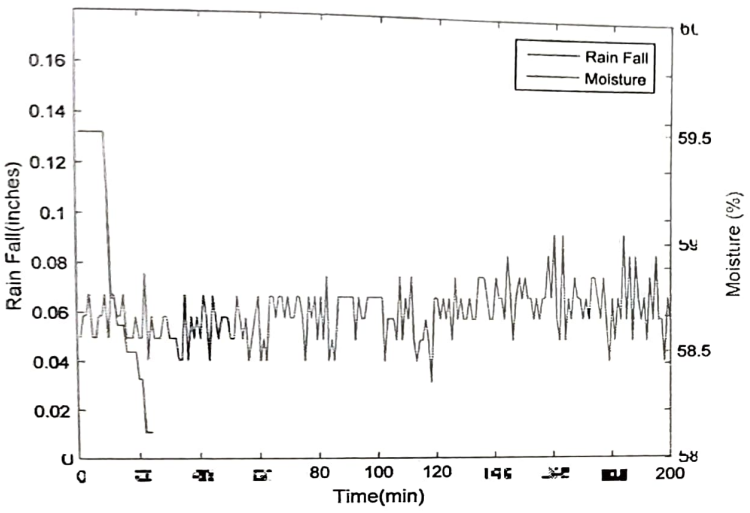


Fig. 5.Rain volume recorderd over a 30-minutewindow.

### C. *Air Temprature and HumidityResults*

Another important environmental data for agricultural IoT applications is the air temperature and humidity. Fig. 6 depicts an example of the recorded air temperature and humidity results.

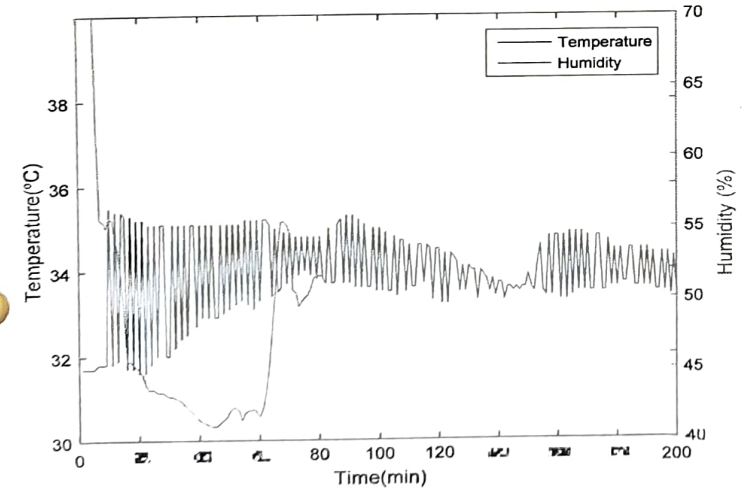


Fig. 6.Temprature and humidity data reports.

The results presented in this section demonstrate the ability of the proposed cloud-based IoT system to efficiently collect, store, process, and visualize the environmental data needed for different precision agriculture applications.

## V. Conculsions

In this paper, we have presented a cloud-based architecture for IoT precision agricultural applications. We have outlined the three layers of the proposed architecture and explained their implementation details. We have built a prototype to illustrate the different performance aspects of the proposed architecture. The preliminary performance evaluation results have demonstrated the efficiency of the proposed architecture – despite its simplicity. This makes the proposed architecture a good candidate for implementing a wide set of precision agriculture systems. Our future work will include how to secure the access of the data and will develop a mobile application that allows access of the data on handheld devices.

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# Adaptive Lane and Sign Detection for Advanced Driver Assistance System


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***Abstract-*** In recent years,Automobile companies are highly concerned with ensuring the safety of the passengers.In Order to provide support to the driver 'Advanced Driver Assistance System' has been employed in vehicles.In this paper we have proposed a robust visual based lane detection algorithm and efficient traffic sign board detection algorithm which could serve as support to the driver.We have used roberts edge detection and hough transform in lane detection algorithm.We have created a database of traffic sign board and with the help of MatchFeature technique we were able to highlight the region of sign board on each frame which is captured by the camera present in the front end of the car.



***Keywords: Region of Interest, Hough Transform, Extractfeatures***


## I. INTRODUCTION

India is meant to have the second largest road network in the world.The accidents occurring on the road has been statistically increasing in the recent years despite of the efforts taken by the indian government.Ministry of Road Transport and Highways Transport Research wing, Government of India presented a report on the topic "Traffic accidents in 2016".The pictorial representation of the causes of the road accidents is shown in Fig. 1.They further stated all the possibilities which were the responsible for road accidents in india.It has been found out more than 80 percent of accidents are due to the driver's negligence.

Exceeding the lawful speed,Driving on wrong side,Using mobile phones while driving,Jumping/Changing the lane,neglecting the signboards are considered to be the major reasons for the road accidents especially in highways.

There is a need of a system which could intimate the driver in times of sudden lane departure and also provides information to the driver about the important life saving sign board which are present on the road.This system could serve as a support to the driver for safe driving.

The adaptive lane detection system is able to detect the lane marking present on the road and the visual output of highlighted lane marking is provided to the driver.Image processing techniques is used to perform the adaptive lane detection process.The sign board detection system detects the sign board present on the road and intimates the driver immediately with the help of a visual and audio output.A database of traffic sign board symbols are collected which helps in identifying and highlighting different sign boards.

## II. LITERATURE SURVEY

In most of the existing lane detection system the first step is to efficiently remove the noise present in the

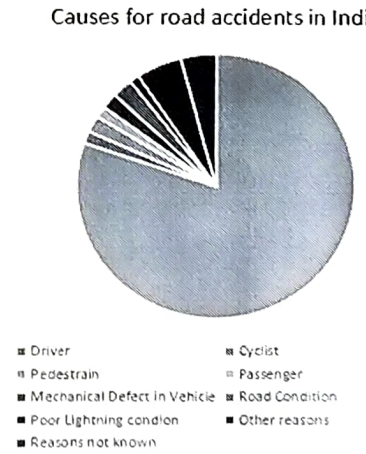



Fig. 1. Datas from Ministry of Road Transport and Highways Transport Research wing

image.There are three types of filters present namely Gaussian filter,Average filter,Median filter.Out of the three

filters Gaussian filter is the efficient one which removes the noise and the edge blurring is less which compared to other filters.The second commonly used step is the edge detection which involves three types namely sobel edge detection,roberts edge detection,prewitt edge detection and canny edge detection.The detection of lane from the edges is a complex process which involves different methods.Most commonly used methods are Hough transform,Modified Hough transform,Generalized Hough transform.[1]uses horizontal differencing filter for edge detection and modified hough transform for detecting the edges.[2]employes the canny method for edge detection and hough transform for detecting the lanes.[7]uses the

entional method of Vanishing point estimation method ich uses probabilistic voting procedure for obtaining the ane.As the field of artificial intelligence tend to get popularized convolutional neural networks were used to perform the sign board detection operation.

## III. Our Approach

*Adaptive lane detection system*

Based on the overview of all the techniques which could be employed in lane detection as mentioned in section II,we have formulated an efficient lane detection algorithm with certain modification in order to improve the efficiency of the system.The flow diagram of the proposed lane detection system is shown in Fig. 2.

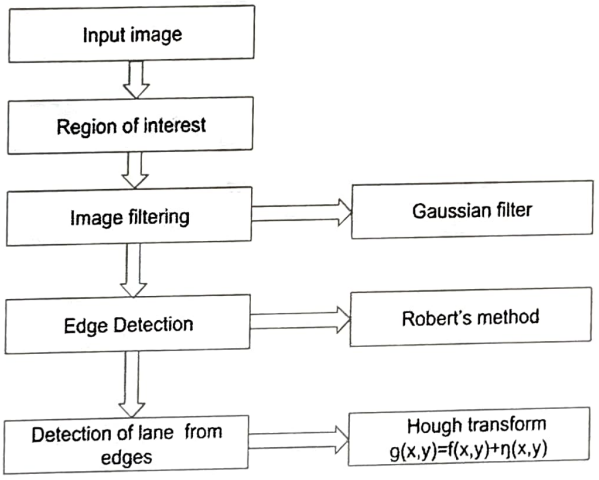



Fig. 2.Flowchart of Adaptive lane detection system

*A.Region of Interest*

The first step of the lane detection algorithm is the region of interest.In this step the potential region which consist of the valuable information about the lane from the frame is segregated and the other regions are blacked out.The region of interest is helpful in reducing the processing time of the program and the memory space required for processing each frame is reduced.Region of interest is also helpful in identifying the lane efficiently without any mismatch.The region of interest for the given frame obtained for the input video is shown in Fig. 3.

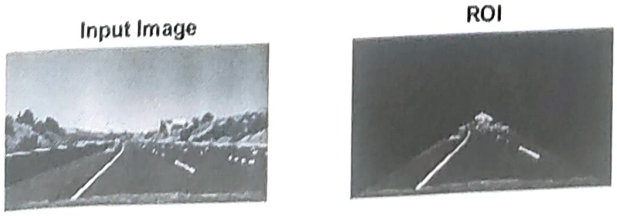



Fig. 3. Region of interest

*B.Image filtering*

As a smoothing filter ,Gaussian filter is used.Based on the comparison with other filter the gaussian filtered image obtained are free from noise and the edge blurring is very less. Equation (1) shows the filtering process.

$$f'(x,y) = (w*f)(x,y)$$

$$(w*f)(x,y) = \sum_{s=-a}^{a}\sum_{s=-b}^{b} w(s,t)f(x-s,y-t) \qquad (1)$$

f(x,y) - Input Image
w(x,y) - Filter Impulse

f'(x,y) - Filtered Image

*C.Edge detection*

Robert's Edge detection is employed in obtaining the edges.The change in intensity between the adjacent pixels are the edges in the frame.Discontinuities in depth,Discontinuities in surface orientation,Change in material properties and Variations in scene illumination are constituents for the edges.The output image after the edge detection process is shown in Fig. 4.

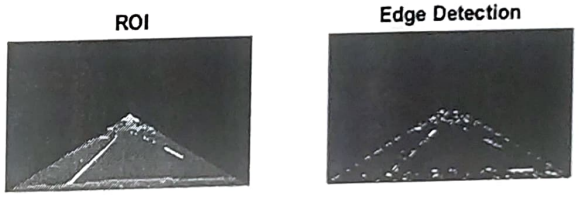



Fig. 4. Edge detection

Detected edges are further processed for removal of unwanted region through similarity of red channel . We are going to dilate the line for detecting it properly in further technique.Further processed image is shown in Fig. 5.

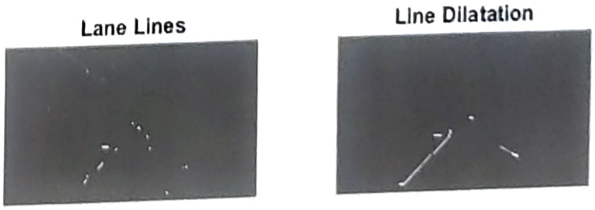



Fig. 5. Lane Lines

*D. Hough transform*

Hough transform is used to extract lines from a given image. Edge detection is considered as a preprocessing to this technique. It uses voting procedure which fills the gaps between points by drawing a line over it which forms the lane. They are initially designed for line

but it can be further developed for other shapes too. we are using Hough transform to detect the lane. sically Hough transform changes the normal xy plane to ab plane.Equation (2) shows the line in xy plane. Equation (3) shows the line in ab plane.

Normally line equation, $y = ax+b$ (2)

x,y be the coordinates

a be the slope(unbounded)

b be the intercept

To convert this to ab plane, $b = -ax+y$ (3)

when x and y are known,the equation b is considered as a line equation in xy plane

The normal to the line b is drawn towards the origin giving R(rho) the length of perpendicular line and

T(Theta) the angle between the a-axis and line.

Now again the another point is transformed until all the lines are drawn in ab plane.The number of lines coinciding at a point is counted as voting. When that point is found it is denoted as (a,b). By substituting we can get lines in x,y plane and the edge points of lines .

The lane is found out depending on the longest line on the plane . This line has the maximum number of collinear points.. The lines are drawn over two sides which leading to the Lane area estimation.The Lane lines drawn shown in Fig. 6.

*E.Output Image*

The joining point of the two straight lines is known as the vanishing points.. In general images are considered in x,y plane. The x- intercept in the vanishing point determines the orientation change of the lane.The identified lane along with the steering direction is displayed as output image shown in Fig. 7.

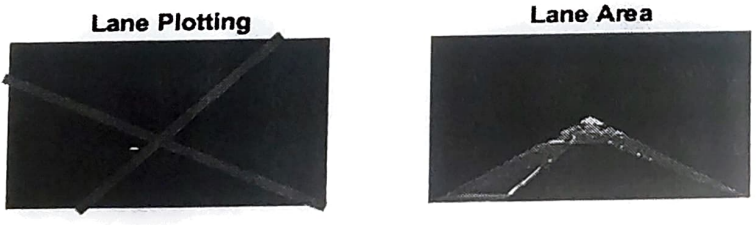



Fig. 6. Lane Area

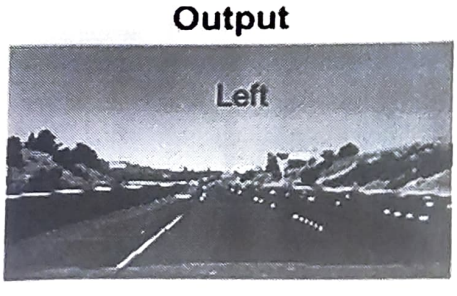
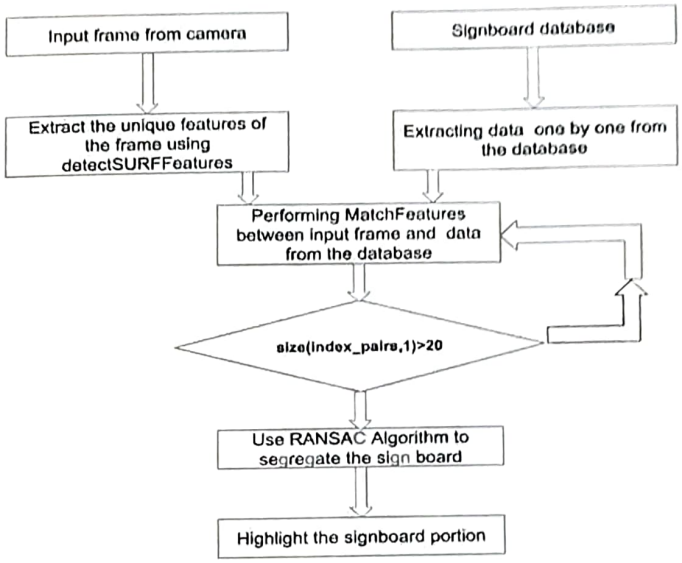



Fig.7. Output

Section II provided the information information about the different techniques which are present in the traffic sign board detection.Taking all the techniques into consideration a robust algorithm is created which perform




the traffic sign board detection operation efficiently.Fig.8 represents the flow diagram of the proposed sign detection system.

Fig. 8. Flow Chart of sign board detection system

*A.Database of Traffic Sign symbols*

The first step of the sign board detection process is creating a database which consist of all the sign board symbol which are meant to be identified and highlighted.The database of the traffic sign symbol is shown in Fig. 9.

*B.Detecting surf features*

Speeded up robust features(SURF) is the technique which obtains the mentioned number of defining feature of objects which is present in the given frame.In our project we are obtaining 25 defining SURF features.The SURF features for a given traffic sign board is shown in Fig. 10.

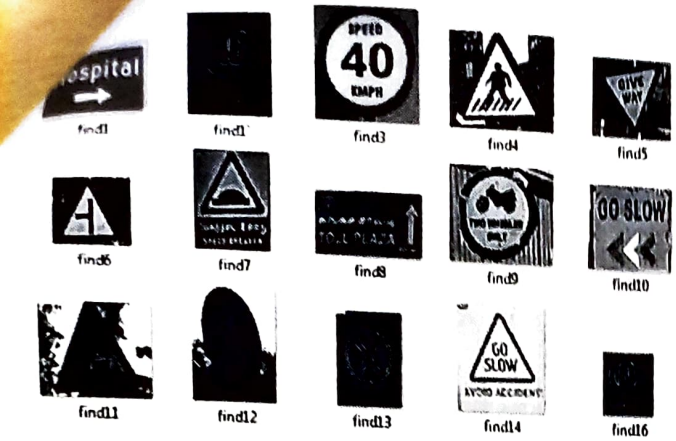



Fig. 9. Database of traffic sign symbols

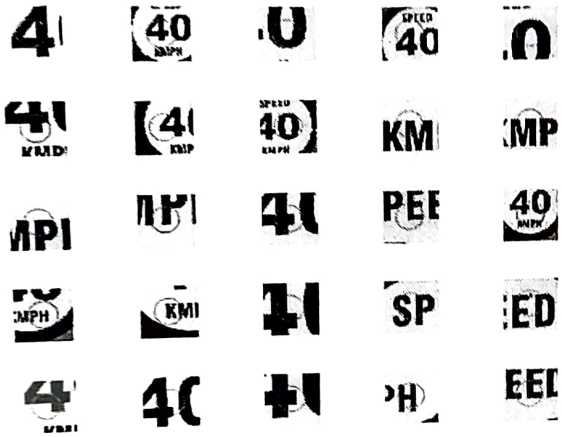


Fig. 10. SURF feature of the sign board


Fig.11.Feature extraction of sign board

*C.Feature Extraction*

The Extract Feature operation help to identify the defining feature and also validates the position where they are present in the frame.The circles are the important defining features present in the frame.Fig. 11 and Fig. 12 represents the feature extraction of sign symbol and the frame which is obtained from the input video.

*D.Match Features*

Match Features requires two images.This feature draws lines connecting the similarities which are present between the two image.The matching features between two images is shown in the Fig. 13.


Fig. 12. Feature extraction of frame obtained from input video

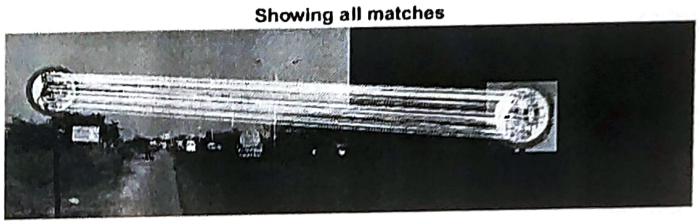



Fig. 13. Match feature

*E.Random Sample Consensus (RANSAC)*

RANSAC algorithm ensures that there are no outliers present and none of the inliner is neglected.The line marking between the similarities of two image is done again with only the inliners.

*F. Output Image*

The traffic sign board is highlighted and the highlighted region is cropped and displayed on the right bottom end of the output video.The Fig. 14 represents the output image.

## IV. Conclusion and Future Scope

We were able to learn different techniques which are involved in lane detection system and sign board detection system.We were able to obtain the proposed output.Our project has better efficiency in highways but when it comes to urban areas the efficiency is less.Thus in future there is a need for adapting efficient technique which could be helpful to the drivers in urban areas.

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