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NEC-ICAIEA-2K21

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Road safety and Vehicle Accident Prevention

[1]L.V.Ramesh, [2]G.Gayatri, [3]K.Sugunitha

[1,2,3] Andhra Loyola Institute of Engineering and Technology,Vijayawada

Abstract- In the upgrading countries accident is the major cause of death.. The intensity of the deaths are more in curved roads. In the roads there will be narrow roads with tight curves. In such situations the driver of a vehicle cannot see vehicles coming from the other side. Because of this problem thousands of people lose their lives each year. While we are talking about mountain roads here, the other side might be led to a cliff. The solution for this problem is alerting drivers about the vehicle coming from the other side. One of the solutions is proposed in this paper. We can alert drivers by placing an ultrasonic sensor on one side of the road before the curve and keeping LED light on the other side of the curve, so that if a vehicle comes from one end of the curve sensor will sense the vehicle and LED light glows at the opposite side as Red. By looking at the Red LED light driver can become alert and can slow down the speed of the vehicle. And still if an accident occurs we can save the life of the victim by giving medical assistance immediately. This can increase the survival chances of victims. but this can happen only when we know the exact location of an accidental place. This paper presents an inexpensive but intelligent framework that can identify and report an accident to the family member. If an accident occurs, the button will be pressed and it will send a message to the family members using the GSM module and send the location of the accidental place using the GPS module.

Key Words: Arduino Nano and Uno, GSM module, GPS module, Ultrasonic sensor, Accidental place.

I. INTRODUCTION

There are many dangerous roads in the world like mountain roads, narrow curve roads, T roads. In these some mountain roads will be very narrow and they contain so many curves. For example Kinnaur road in Himachal Pradesh, Zoji La Pass in the Himalayas, the Road of Death Bolivia, Fairy Meadows Road (Pakistan)[1]. Some roads have tight curves with steep climbing. In such kind of situation the driver of the vehicle is not able to see the vehicle coming from other side and this can be a cause of accident at mountain roads/hill roads[2].The main motive of this project is to find the accident spot of any place and make alert to family member through the GPS and GSM network. Accident detection and prevention system contains an ultrasonic sensor for sensing objects and passing information to the Arduino nano. The LED is connected to an Arduino nano which will blow as Red after detection of an object and it will alert the driver of the vehicle coming from the other side[3]. The GPS based vehicle Accident identification module contains a GSM module and a GPS module connected to the Arduino Uno.GSM is used to establish cellular connection and GPS is used to trace the position of the vehicle. Now-a-days it is

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WHOLESALE AND RETAIL STORE MANAGEMENT SYSTEM

Siva Rama Krishna. K[1] ,Saranya Bala.Y [2] ,Triveni.V[3] , Sai Divya[4]

Department of Computer Science and Engineering,
Andhra Loyola Institute of Engineering and Technology,
Jawaharlal Nehru Technological University – Kakinada

[1]Associate Professor CSE Department sivaramkosuru@gmail.com
[2]saranya.sony03@gmail.com
[3]triveni.viswanadhapalli@gmail.com
[4]divyasai921@gmail.com

***Abstract*—With the increase in the number of Wholesale and Retail stores along with the consumers, a system that could manage the functionalities of a store with a set of computerized instructions which is cost-effective and could minimalize the errors would be very helpful in managing store effortlessly. In this paper, we are going to discuss the system that can effectively help in managing the store and also furnished with the option of sales analysis that provides a deep glimpse into the performance of sales including their successes and their shortcoming, as well as customer shopping data and incoming revenue so that the user can have a better acknowledgment of all the transactions that are carried out in the store.**

Keywords—Retail Store Management, PHP, Ajax, MySQL, html, JavaScript, Bootstrap

I. INTRODUCTION

The wholesale and Retail Store Management System is a system that is solely based on the fact of cost-effectiveness and effortless management. The system that is currently in use in most of the supermarts is the bar-code system which is highly efficient and less arduous but due to it being a pricey system it cannot be implemented by small-scale retail stores that are existing. To provide an affordable system to these small-scale stores that can manage the store and also analyses the information that can be easily broken down by the user so that further enhancements can be made to the store by the user. The system is equipped in such a way that even if the user doesn't have any prior knowledge of technology, they may find it easy to operate.

II. . ABOUT THE PROPOSED WORK

A. Literature Survey

This section is to cogitate about pre-existing systems with similar resolutions and the drawbacks of the system. The management systems that are prevailing currently is bar-code system and inventory. A barcode system is a network of hardware and software, consisting primarily of mobile computers, printers handheld scanners, infrastructure, and supporting software whereas an inventory system manages the information of the stock that is present in the store. The bar-code system is very complicated since it involves too many devices and also an adhesive bar-code needs to be labeled to every item to check out the item while billing. This process of labeling has lots of problems

It is time-consuming and labor-intensive as they must be scanned individually. This process needs to be done meticulously. Barcodes are more easily damaged because barcodes need to be exposed and must be on the outside of the product. If a barcode is damaged then there is no way of scanning the product. Any errors may lead to losses in the business. It is very highly-priced and is not affordable by small-scale stores.

Now considering the inventory system, the system only provides the user with the details of the stocks that are present in the store which is to be manually updated by the user. The inventory system might not necessarily be incorporated with the billing system and analysis.

Some retail management system solutions provide standalone functionality for tracking sales, inventory, or analysis management. The drawbacks of a standalone retail management system are that these systems manage a single business function and cannot contain all the functions that are required in a single system.

B. Proposed Work

In this section, the proposed work is instantiated comprehensively

1)Design Methodology:

The retail store management system is arrayed with two modes namely basic mode and advanced mode. The basic mode is made only for the user who does not have the foremost knowledge of operating technology. The user can simply generate a bill using the items purchased with their respective price and quantity by the customer. The total price will be automatically calculated by the system according to the prices of the items given previously to the system. If the user wishes to make any alterations to the items then the items in the cart can be edited using the edit button. The user can switch between the modes using the back to the home button.

In the advanced mode, the user has access to additional options inventory and information. The inventory page can be utilized by the user to store details about items that are present in the store along with their respective prices and quantity whereas the information page consists of two extensions – analysis and charts. The analysis section contains information likely the number of customers, total number of transactions, and also the count of items that are present in the inventory. The charts section comprises daily, monthly and yearly charts which helps the user obtain a clear understanding of the sales.

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Mask R-CNN for Fire Detection

Sk Razeena Begum[1], S Yogananda Datta [2], M S V Manoj [3]

Department of Computer Science and Engineering, Andhra
Loyola Institute of Engineering and Technology,
Jawaharlal Nehru Technological University - KakinadaAssistant
Professor CSE Dept[1] razeenabegum@gmail.com
[2]datta.seethepalli557@gmail.com
[3]saimanoj9542@gmail.com

***Abstract*— Object detection has an increasing amount of attention in recent years due to its wide range of applications and recent technological breakthroughs. Deep learning is the state-of-art method to perform object detection .This task is under extensive investigation in both academics and real-world applications such as security monitoring, autonomous driving, transportation surveillance, drone scene analysis, robotic vision etc., It is a computer technology related to computer vision and image processing which deals with detecting instances of semantic objects of a certain class (such as humans, buildings, or cars) in digital images or videos. It not only provides the classes of the objects in an image, but also localize them in that particular image. The location is given in the form of bounding boxes or centroids. Instance segmentation may be defined as the technique that gives fine inference separately for each object by predicting labels for every pixel of that object in the input image. Each pixel is labelled according to the object class within which it is enclosed. We deal with Mask Region Based Convolutional Neural Network (Mask R-CNN) to implement instance segmentation and detection of fire in a video or an image which can be used in real-world such as automatic fire extinguisher and alert systems. Training was done using Mask R-CNN for object detection with ResNet-101 backbone, with 0.001 learning rate and 2 images per GPU. With this, the proposed framework can detect fire using Mask Region-Based Convolutional Neural Network and can send immediate alert to the user if fire is detected**

Keywords*— *Object Detection, Instance Segmentation, Fire, Mask R-CNN, ResNet-101

I. INTRODUCTION

Like many other computer vision problems, there still isn't an obvious or even "best" way to approach object detection problems, meaning there's still much room for improvement. Deep learning has been a real game changer in machine learning, especially in computer vision. In a similar way that deep learning models have crushed other classical models on the task of image classification. Deep learning models are now state of the art in object detection as well. There are few models in deep learning previously used for object detection. Most notably is the R-CNN, or Region-Based Convolutional Neural Networks, and the most recent technique called Mask R-CNN that is capable of achieving state-of-the-art results on a range of object detection tasks. Instance Segmentation is the task of pixelwise identification of an object in an image

With rapid economic development, the increasing scale and complexity of constructions has introduced great challenges in fire control. Therefore, early fire detection and alarm with high sensitivity and accuracy is essential to reduce fire losses. However, traditional fire detection technologies, like smoke and heat detectors, are not suitable for large spaces, complex buildings, or spaces with many disturbances. Due to the limitations of above detection technologies, missed detections, false alarms, detection delays and other problems often occur, making it even more difficult to achieve early fire warnings.

Recently, image fire detection has become a hot topic of research. The technique has many advantages such as early fire detection, high accuracy, flexible system installation, and the capability to effectively detect fires in large spaces and complex building structures. It processes image data from a camera by algorithms to determine the presence of a fire or fire risk in images. Therefore, the detection algorithm is the core of this technology, directly determining the performance of the image fire detector

Labeling the specific pixels in the image that comes to each distinguished object instead of using coarse bounding boxes during object recognition and localization is an extension of object detection. This harder type of problem is commonly referred to as object segmentation. The R-CNN, or Region-Based Convolutional Neural Network, is created by Ross Girshick, et al. And it is a family of convolutional neural network models intended for object detection.

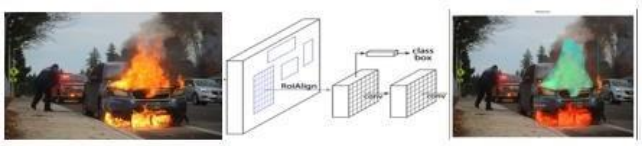

Fig. 1. Mask R-CNN Fire detection and segmentation

According to Ross Girshick, Mask R-CNN covers Faster R-CNN predicting segmentation masks is an addedbranch for each (ROI) Region of Interest, similar to the current branch for bounding box regression and classification shown in (Fig 1). One of the papers using MASK R-CNN is the Fruit detection for strawberryharvesting robot, according to Yang Yu the paper determines enhanced robustness and universality for hidden and overlapping fruits, and those under changeable illumination.

Fig.2. FIRE ACCIDENT

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SMART PARKING SYSTEMUSING WEB APPLICATION

Sk Razeena Begum[1], S Anand[2], K Vivek[3], K Manideep[4]

Department of Computer Science and Engineering, Andhra Loyola Institute of Engineering and Technology
Assistant Professor CSE Dept, ALIET
[1]razeenabegum@gmail.com[2]anandsanthi111@gmail.com [3]kadirivivek123@gmail.com [4]manideepkumar1435@gmail.com

***Abstract*— In this project we are developing an application for smart parking system, this system can be useful for parking system in malls, theaters, hospitals etc…. In this application the user need to login and select the place where they need parking and also need to mention the time duration in hours. If the place was free that would be allocated to the person and when person leave it will show free.**

Keywords*— Parkinglot , Users , Database , Server , Smart Parking , Web A*

I. INTRODUCTION

Seeking a vacant parking space during peak hours in areas like Hospitals, Hotels & Shopping Centers, Universities, and Exhibitions has always been causing troubles for many drivers. Survey says that traffic generated by cars searching for vacancies in Parking Spaces is up to 40% of the total traffic. Now that is a serious issue to look after, and Smart Parking System is one of the best available solutions . This application gives information about the occupancy status of the spaces in the parking lot equipped with application that detect the available of slots.

II. ABOUT THE PROPOSED WORK

A. Literature Survey

As the first of the project, we decided to write a brief history of car parking system and its processes so as to enlighten and understand clearer what the project is all about. Some of the features of the current car parking systems will be documented here, together with the major and general types of car parking system. We hope to find and document some basic advantages, disadvantages used in parking area. The chapter is also going to explore the product of the research conducted on existing car parking systems. The scope of this chapter is basically to identify some car parking system and compare them, to produce some limitations of the current system. . Types of car Parking System Based on the research, there are mainly four categories of park guidance systems using different technologies –image-based, counter-based. Image based Image based techniques or some people call it as video sensor techniques. There are arguments concerning the viability of using image-based techniques. DISADVANTAGE: The disadvantages are video sensor is energetically expensive and video sensor can generate large amount of data which can be difficult to transmit in a wireless network. Counter-based The last category of car park guidance systems use is Counter-based systems which use sensors to count the number of vehicles entering and exit a car park area. This can be gate-arm counters and induction loop detectors located at the entrances and exits. DISADVANTAGE: This system can give information on the total number of vacant lots in a closed car park area, but does not help much in guiding the driver to the exact location of the vacant lots. Manual Parking A car enters the car parking area. The concerned worker their checks for the availability of slots for the car. This checking process involves multiple chains of asking the co-workers at different slots of that are either directly or through internal calling systems. If there is a slot available then the car is directed to that place by manual guidance which is prone to have hindrances at multiple places before reaching the allotted slot. If there is no slot available, then the car has togo back and search for a parking slot in some other car parking area. DISADVANTAGES: Due to manual guidance there will be disturbance and confusion among drivers to reach the desired parking slot which leads to clash of vehicles and more fuel consumption and wastage of time and reduces the human efficiency. Hence we proposed a project called “SMART PARKING SYSTEM” using detection sensors such as Infrared sensors which are installed at each parking lot. These sensors are wired to a central control unit that store and manage the parking occupancy information. This information is then forward to display panels at intentional locations in the vehiclepark.

B. Proposed Work

Functional Requirements:

1. Login
2. Show 4 parking places
3. Each place has 4 parking slots
4. So in app u can book any slot in any parking place
5. If someone booked, it will show red color in app to otheers like it is already booked
6. In this app each slot booked will be for 1 hr only ., if u want to continue for next hr then u have to book again

Non-Functional Requirements:

1. Design more user friendly Environment.
2. Improve the performance using better component design.
3. Performance.
4. Reliability.
5. Scalability.

Technologies used:

1. Android.
2. PHP.

Tools Used:
Android studio.

Server Used:

UWAMP Server.

Database Used:
MYSQL

Technologies used:

Android:

Android is a mobile operating system basedon a modified version

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Music Recommendation Application Based on Facial Expressions

MD Arsha Sultana[1], Abdul Saherabegum[2], Akhila Umma[3], Guthula Jayasri Sai Nikitha[4]

Department of Computer Science and Engineering,
Andhra Loyola Institute of Engineering and Technology,
Jawaharlal Nehru Technological University - Kakinada

Assistant Professor CSE Dept, ALIET [1]arsha.1205@gmail.com
[2]sahera.abdul320@gmail.com
[3]akhilaumma2544@gmail.com
[4]jssnikitha@gmail.com

Abstract— Music is the form of art, which is known to have a greater connection with a person's emotion. It has got a unique ability to lift up one's mood. Our project focuses on building an efficient music recommendation system which determines the emotion of user using Facial Recognition techniques. It has widely attracted attention due to its enormous application value and market potential. Face recognition Technology is being implemented in various fields like security system, digital video processing, and many such technological advances. Moreover, on a larger dimension, this would render savage of time and labor invested in performing the process manually. We use Viola Jones algorithm for face recognition and Fisher Face classifier for identifying facial expressions. The overall concept of the system is to recognize facial emotion, mood and recommend songs efficiently. The proposed system will be both time and cost efficient.

Keywords— Facial Recognition, Emotion detection, Algorithms

I. INTRODUCTION

In course of history, Music is the greatest creation of mankind. In this 21st century, we see so many people attached to their headphones listening to music at any given time. People tend to listen to different types of genres in different occasions depending on their mood. Creating customized playlists for different occasions at any given time depending on the user's mood will be very much useful. By using the advanced technology, mood detection and recommendations can be possible for the better usage.

II. ABOUT THE PROPOSED WORK

A. Literature Survey

There are many algorithms and classification techniques for every problem in Machine Learning. Choosing a right method is essential to create a customized solution for different problems. This section overlooks similar existing advantages, disadvantages, similarities, measures for evaluating the algorithm, sample value of evaluations and examines the algorithms used and drawbacks. Enhancing on emotion detection and generating a playlist for the user is main task. Facial Recognition is done using Machine learning specifically Support Vector Machines. A face is initially detected by using Viola Jones algorithm. Then feature extraction on face is performed using Histogram of Oriented Gradients which essentially stores the edge of the face as well as the directionality of the edges. Training and classification of the facial databases is done using the multi class SVM where each unique face in the Facial database is a class. The system uses user's image using camera, detects the face and emotions to recommend a playlist which can enhance the user. This approach minimizes the efforts by suggesting the user a list of songs based on his current emotion.

B. Project Objective

Everyone battle with emotions due to different reasons, ultimately everyone wants to be happy. Our primary goal is to recommend music by detecting the mood of a person. As music holds the power to cheer up a person's mood, our project aims to recommend the best playlist which matches the mood of a person and ends with cheerful music. Through this project, we are creating an application which can make a person happier by detecting the mood of a person using facial recognition techniques.

C. Proposed Work

In this section, the proposed work is elaborated at a high-level scope. Here we can understand the user interface and working nature of the application

1) Design Methodology:

The proposed system recommends music that is based on automatic emotion detection. A webcam is used to capture the images that will be used as input to the proposed system, and then it goes to the expression detector to classify it to one of four classes "Happy", "Sad", "Neutral" and "Angry" and then it recommends a song as the figure below.

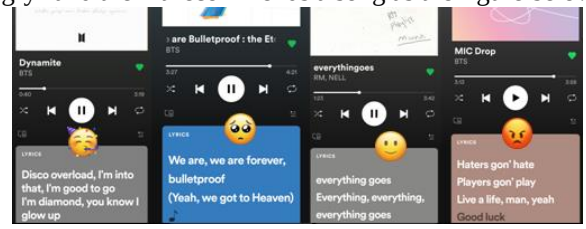

Fig.1 Song Recommendations based on User's mood

2) System Architecture:

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AMAZON PRODUCT REVIEW SENTIMENT ANALYSIS USING MACHINE LEARNING

MD. Arsha Sultana [1], P. Rakesh[2], M. Sandeep[3], G. Jagadeesh[4]

Department of Computer Science and Engineering,
Andhra Loyola Institute of Engineering and Technology,
Jawaharlal Nehru Technological University - Kakinada
Assistant Professor CSE Dept, ALIET [1]arsha.1205@gmail.com
[2]rakeshpasupuleti550@gmail.com
[3]sandeepmedikonda45@gmail.com
[4]blue.jayath@gmail.com

***Abstract*— As online marketplaces have been popular during the past decades, the online sellers and merchants ask their purchasers to share their opinions about the products they have bought. As a result, millions of reviews are being generated daily which makes it difficult for a potential consumer to make a good decision on whether to buy the product. Analyzing this enormous amount of opinions is also hard and time consuming for product manufacturers.But in this prospering day of machine learning, going through thousands of reviews would be much easier if a model is used to polarize those reviews and learn from it. This thesis considers the problem of classifying reviews by their overall semantic (positive, negative or neutral). To conduct the study different supervised machine learning techniques, Support Vector Machine, Naive Bayes, Decision Tree, Random Forest, and Logistic Regression has been attempted on products review dataset from Amazon. Their accuracies have then been compared.**

***Keywords*— Supervised Machine Learning Techniques, Support Vector Machine, Naive Bayes, Decision Tree, Random Forest, and Logistic Regression**

I.INTRODUCTION

Online shopping tendency is meritoriously boosting after the advent of bricks-and-mortar retailers. In the year of 2016, e-retailers have generated an estimated revenue of 1.9 trillion U.S. dollars (7.4% of total retail sales) from 1.61 billion customers globally. Amazon, the leading international e-retail company, has more than 310 million active customer accounts who bought near 136 billion U.S. dollars' goods in 2016 (Statista, 2017). In the first month of demonetization, the growth of digital payment in the world's third purchasing power parity country (India) escalated 271% and simultaneously the cash on delivery dropped about 30–40% (Chronicle, 2017). Furthermore, out of the total online market, consumers approximately purchase 34% of durable goods (Sen, 2013). Thus, an analysis of online consumer's opinion is a vital aspect in the e-commerce market to represent online shopping in an eloquent way.

II.ABOUT THE PROPOSED WORK

Literature Survey

Due to the proliferation of online reviews, Sentiment analysis has gained much attention in recent years. Therefore, many studies have been devoted to this research area. In this section, some of the most related research works to this thesis are presented.

Joachims (1998) experimented SVM for text classification and showed that SVM performed well in all experiments with lower error levels than other classification methods. Pang, Lee and Vaithyanathan (2002) tried supervised learning for classifying movie reviews into two classes, positive and negative with the help of SVM and Naive Bayes and maximum entropy classification. In terms of accuracy all threetechniques showed quite good results. In this study they tried various features and it turned out that the machine learning algorithms performed better when bag of words was used as features in those classifiers. In a recent survey that was conducted by Ye et al. (2009), three supervised machine learning algorithms, Naive Bayes, SVM and N-gram model have been attempted on online reviews about different travel destinations in the world. In this study, they found that in terms of accuracy, well trained machine learning algorithms performs very well for classification of travel destinations reviews. In addition, they have demonstrated that the SVM and N-gram model achieved better results than the Naive Bayes method. However, the difference among the algorithms reduced significantly by increasing the number of training data set. Chaovalit and Zhou (2005) compared the supervised machine learning algorithm with Semantic orientation which is an unsupervised approach to movie review and found that the supervised approach provided was more reliable than theunsupervised method.

According to many research works, Naive Bayes, SVM are two most used approaches in sentiment classification problems (Joachims 1998; Pang et al. 2002; et al. 2009). This thesis, therefore tries to apply supervised machine learning algorithms, Support Vector Machine, Naive Bayes, Decision Tree, Random Forest, and Logistic Regression to the product reviews of Amazon website.

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NEC-ICAIEA-2K21

16th- 17th JULY, 2021

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Professor,
Department of Computer Science and Engineering
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Trust-based Privacy PreservingPhoto Sharing in Online Social Networks

R Padmaja[1], Sk.Shahnoor [2], N.Nikhila[3], L.Thanusha[4]

Department of Computer Science and Engineering,
Andhra Loyola Institute of Engineering and Technology,
Jawaharlal Nehru Technological University - Kakinada
Assistant Professor CSE Dept,ALIET rakkisu.padmaja@aliet.ac.in

[2]shahnoorshaik00@gmail.com

[3]nnk.nikhila@gmail.com

[4]23thanushalevaku@gmail.com

***Abstract*— In the present social media technologies, sharing photos in online social networks has now become a popular way for users to maintain social connections with friend's others. However, the rich information contained in a photo makes it easier for a malicious viewer to infer sensitive information about those who appear in the photo. How to deal with the privacy disclosure problem incurred by photo sharing has attracted much attention in recent years. When sharing a photo that involves multiple users, the publisher of the photo should take into all related user's privacy into account. In this paper, we propose a trust-based privacy preserving mechanism for sharing such co-owned photos. The basic idea is to anonymize the original photo so that users who may suffer a high privacy loss from the sharing of the photo cannot be identified from the anonymized photo. The privacy loss to a user depends on how much he trusts the receiver of the photo. And the user's trust in the publisher is affected by the privacy loss. The anonymization result of a photo is controlled by a threshold specified by the publisher. We propose a greedy method for the publisher to tune the threshold, in the purpose of balancing between the privacy preserved by anonymization and the information shared with others.**

***Keywords*— Facial Detection, Facial Detection, Image Processing Technique, Social Media Platform**

I. INTRODUCTION

The social media platforms which are we using in our day-to-day life are well equipped in terms of current trends and technology. But the major problem that arises here is with the security of the user's data(photos) so, now if we can able to address the solution for this problem. We can put a check on the miscellaneous usage of photos and this problem can be solved by detecting the faces of the people in a particular picture. And by sending a notification to the concerned person. Whether he wants to allow the picture to post or not.

II. ABOUT THE PROPOSED WORK

A. Literature Survey

The human face brings with its appearance and shape a number of clues enabling the extraction of information about person identity, gender, age, ethnicity, health, emotional state and physical wellness, to name but a few. Face recognition has a critical role in biometric systems and is attractive for numerous applications including visual surveillance and security, medical imaging, and affective computing. Though there has been a great deal of progress in face detection and recognition in the last few years, many problems remain unsolved.

- My Privacy My Decision: Control of Photo Sharing on Online Social Networks (Kaihe Xu, Yuanxiong Guo, Linke Guo, Yuguang Fang, Xiaolin Li)– April 2017
- Privacy-Preserving Relived Experiences in Virtual Reality (Cheng Yao Wang) – May 2020
- Advantages of Having Users' Trust and Reputation Values on Data Sharing Process in Online Social Network (Gulsum Akkuzu, Benjamin Aziz, Mo Adda) – October 2019
- Privacy-Preserving Photo Sharing based on a Secure JPEG (Lin Yuan, Pavel Korshunov, and Touradj Ebrahimi) – May 2015

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Bitcoin Price Prediction

R Padmaja[1], K.V.D Hanisha[2], B Amulya[3], M Harika[4]

Department of Computer Science and Engineering,
Andhra Loyola Institute of Engineering and Technology,
Jawaharlal Nehru Technological University - Kakinada
Assistant Professor CSE Dept, ALIET [1]rakkisu.padmaja@aliet.ac.in
[2]hanishakalla2@gmail.com
[3]amulyabhimineni@gmail.com
[4]Harikamatha50@gmail.com

***Abstract*— Bitcoin is currently the leading global provider of cryptocurrency which has recently received a lot of attention from the public. In recent years, the Bitcoin network has attracted investors, businesses, and corporations while facilitating services and product deals. The factors that affect the Bitcoin price and the patterns behind its fluctuations can be predicted by using various machine learning models like LSTM, ARIMA, and Facebook prophet. This prediction may give better insights about the bitcoin price to the people who are investing in the bitcoin. Accurate prediction of the future trend in the closed price of the day for a given cryptocurrency is a challenging task. Machine Learning models can be used to predict the closed price for a given cryptocurrency**

***Keywords*— Prediction, Bitcoin, Cryptocurrency, LSTM, ARIMA, Facebook Prophet**

I.INTRODUCTION

In today's era, the planet is digitalizing. there's a probability that digital cash replaces the physical sort of cash. Cryptocurrency is digital cash that's very fashionable. The cryptocurrency may be a money-like asset that's primarily managed or exchanged on computer systems. Cryptocurrencies use blockchain technology so that they are highly secure and transparent. So, cryptocurrencies can become a replacement sort of taking advantage of the longer term. There are morethan 900 cryptocurrencies currently available to take a position online and this number is consistently growing. of those cryptocurrencies, undoubtedly the foremost popular has been Bitcoin and it had been also the primary cryptocurrency within the market. People can make use of bitcoin rather than cash.

II.ABOUT THE PROPOSED WORK

A.Literature Survey

This section overlooks similar existing solutions and examines the algorithms used and drawbacks. Enhancing Bitcoin Price Fluctuation Using Attentive LSTM and Embedding network [1] study used traditional machine learning including Random Forest, XGBoost, Support Vector Machine to predict the Bitcoin price. However, traditional machine learning methods cannot capture the time dependency of time series. Recently, deep learning methods such as Recurrent Neural Networks (RNN) can handle the issue of time dependency. However, RNN is struggling to find out long-term dependencies thanks to the vanishing gradient. LSTM and Gated Recurrent Unit (GRU) that are the foremost commonly used variants of RNN can solve the vanishing gradient problem. A drawback of this study is long-term dependencies due to the vanishing gradient problem. Next day bitcoin price forecast using NNAR and ARIMA [2] analyses forecasts of Bitcoin price using the autoregressive integrated moving average (ARIMA) and neural network autoregression (NNAR) models. Employing the static forecast approach, we forecast next-day Bitcoin prices both with and without re-estimation of the forecast model for each step. For cross-validation of forecast results, considering two different training and test samples. In the first trainingsample, NNAR performs better than ARIMA, while ARIMA outperforms NNAR in the second trainingsample. Despite the sophistication of NNAR, this paper demonstrates ARIMA's enduring power of volatile Bitcoin price prediction. A drawback of this study is the main problem we study is it predict the price of bitcoin in the next day (that is, to predict the price after 288 data points).

B. Proposed Work

In this section, the proposed work is elaborated at a high-level scope.

1) Design Methodology:

The long short-term memory network(LSTM) addresses the common problem of disappearing gradients in the recurrent neural network. This is a type of recurrent neural network that is used in profound learning, as very large architectures can be trained. LSTM enables the network to learn more about many time steps by maintaining a steadier error. This enables the network to learn long-term trust. LSTM cell contains forget and remember gates that allow the cell to decide which information to block or transmit based on its strength and importance. As a result, weak signals that prevent the gradient from disappearing can be blocked. The performance of the LSTM network is assessed to determine the model's efficiency.

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Eye Ball Cursor Movement Using OpenCV

[1]D.Bharadwaja, [2]B.Preethi [3]K.Charithra Lavanya N.Sony,

Department Of Computer Science and Engineering
Andhra Loyola Institute of Engineering and Technology
Jawaharlal Nehru Technological University-Kakinada
Assistant Professor CSE Dept,ALIET,
[1]bharadwaja599@gmail.com

Abstract- There are different reasons for which people need an artificial of locomotion such as a virtual Mouse. The proposed application in the project could be used for obtaining accuracy by the regular users and especially by the physically challenged people who want to operate the computers. A high number of people, who are paralyzed by the injury, and cannot use computers for basic tasks such as browsing the internet, operating the mouse, sending and receiving the messages. In this scenario, the eye ball cursor movement will help to provide the eye movements, which would allow bringing the use of computers back to such individuals.

For bringing the project into operational mode, the camera will be used for capturing the image of eye movement. Initially, it will detect the eye, secondly, it would detect pupil center position of eye and lastly different variations of pupil positions .The signals will pass from the motor driver to interface with the virtual controller itself. The motor driver will control both speed and direction to enable the virtual keyboard to move forward, left, right and stop. The cursor movement of computer would be controlled by eye movement using OpenCV.

Keywords-OpenCV, Motor Driver, Virtual Mouse, Artificial of Locomotion

I.INTRODUCTION

Nowadays, personal computer systems take a vast part in our day to day survival since they are used in areas such as at workplace etc. These applications have one thing in common i.e. the use of personal computers is mostly dependant on the data input methods such as mouse. But this is not a problem in case of a healthy individual; this may be a problem for people with less freedom of movement of their limbs. In such cases, it might be preferable to use input methods which supports the abilities of the region such as eye movements. To enable such input method as a substitute, a system is designed which follows a low-cost approach to control cursor on a computer system without the use of mouse. In the proposed system, the cursor movement of the computer system is controlled by the eyeball movement using OpenCV. It is interfaced with IP camera which detects the Eyeball movements and based on these eyeball movements the cursor can be controlled accordingly which are processed using the OpenCV.

As the computer technologies are growing rapidly, the importance of human computer interaction becomes highly notable. Some persons who are disabled cannot be able to use the computers. Eye ball movement control mainly used for disabled people. Incorporating this eye controlling system with the computers will make them to work without the help of other individual. Human-Computer Interface (HCI) is focused on use of computer technology to provide interface between the computer and the human. There is a need for finding the suitable technology that makes the effective communication between human and computer. Human computer interaction plays the important role .Thus there is a need to find a method that spreads an alternate way for making communication between the human and computer to the individuals those who have impairments and give them an equivalent space to be an element of Information Society.

In recent years, the human computer interfaces are attracting the attention of various researchers across the globe. Human computer interface is an implementation of the vision-based system for eye movement detection for the disabled people.

In the proposed system, we have included the face detection, face tracking, eye detection and interpretation of a sequence of eye blinks in real time for controlling a nonintrusive human computer interface. Conventional method of interaction with the computer with the mouse is replaced with the human eye movements. This technique will help the paralyzed person, physically challenged people especially person without hands to compute efficiently and with the ease of use. Firstly, camera captures the image and focuses on the eye in the image using OpenCV code for pupil detection. This results the centre position of the human eye (pupil). Then the centre position of the pupil is taken as a reference and based on that the human or the user will control the cursor by moving left and right.

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Dr S V N SREENIVASU

Professor of COMPUTER SCIENCE AND ENGINEERING, NEC

Convener, NEC-ICAIEA-2K21

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A Data Mining based Model for Detection of Deceitful Behaviour in Water Consumption

[1]B.V.Satish Babu,, [2]Ch.Tejasri, [3]V.Naga Jyothi, [3]K.Navya,

[1,2,3,4]*Andhra Loyola Institute of Engineering and Technology, Vijayawada*

Abstract*—Fraudulent behavior in drinking water consumption is a significant problem facing water supplying companies and agencies. This behavior results in a massive loss of income and forms the highest percentage of non-technical loss. Finding efficient measurements for detecting fraudulent activities has been an active research area in recent years. Intelligent data mining techniques can help water supplying companies to detect these fraudulent activities to reduce such losses. This research explores the use of two classification techniques (SVM and KNN) to detect suspicious fraud water customers. The SVM based approach uses customer load profile attributes to expose abnormal behavior that is known to be correlated with non-technical loss activities. The data has been collected from the historical data of the company billing system. The accuracy of the generated model hit a rate of over 74% . To deploy the model, a decision tool has been built using the generated model. This will help to predict suspicious water customers to be inspected on site.

Keywords— Fraud Detection, Data Mining, SVM, KNN, Water Consumption.

I. INTRODUCTION

Water is an essential element for the uses of households, industry, and agriculture. Jordan, as several other countries in the world, suffers from water scarcity, which poses a threat that would affect all sectors that depend on the availability of water for the sustainability of activities for their development and prosperity. The mentioned Irregularities are known as non-techni- cal losses (NTLs). NTLs originating from electricity theft and other customer malfeasance are a problem in the electricity supply industry.NTL is a problem in water supply industry too because of the similarity between water and electricity distribution systems in depending on meter technology and load profiling concept [1].

NTLs include the following activities 1) Losses due to faulty meters and equipment. 2) Tampering with meters so that meters record low rates of consumption. 3) Stealing by bypassing the meter or otherwise making illegal connections. 4) Arranging false of internal employees by means of such subterfuges as making out lower bills, adjusting the decimal point position on the bills, or just ignoring unpaid bills. Fraud is a serious problem facing information systems that are implemented in various domains. [2] Credit card transactions as a financial system branch had a total loss of 800 million dollars of fraud in the U.S.A. and 750 million dollars in U.K. in the year 2004 . In the area of health care according to transparency international , the total expenditure exceeds the amount of 3 trillion euro worldwide. That size in the healthcare industry induces several actors in the field to make a profit by using illegal means, forbidden financial operations committing health care fraud [2].

A. Problem Statement

This water crisis situation has been aggravated by the rapid population growth and mismanagement. Efforts of the water suppliers to improve water and sanitation services are faced by managerial, technical and financial determinants and the limited amount of renewable freshwater resources [3].

B. Objective of the project

1) Well-known data mining techniques to build a suitable model to detect suspicious fraudulent customers. 2) Depend-ing on their historical water metered consumption. 3) Water supplying companies incur significant losses due to fraud operations in water consumption. 4) This model introduces an intelligent tool that can be used to detect fraud customers and reduce their profit losses.

II. RELATED WORK

This section reviews some of the applications of data mining classification techniques in fraud detection in different areas such as Detection of Fraudulent Financial Statement, Fraud Detection in Mobile Communication Networks, Detecting Credit Card Fraud, and Fraud Detection in Medical Claims. For example,Kirkos et al. [4] proposed a model for detecting fraud in financial statements, where three data mining classi- fiers were used, namely Decision Tree, Neural network and Bayesian Belief Network. Shahine et al. [5] introduced a model for credit card fraud detection; they used decision trees and supported vector machines SVM. In addition, Panigrahi et al. [6] proposed a model for credit card fraud detection using a rule- based filter, Bayesian classifier, and Dempster-Shafer adder. Carneiro et al. [7] developed and deployed a fraud detection system in a large e-tail merchant. They explored the combi- nation of manual and automatic classification and compared different machine learning methods. Ortega et al. [8] proposed a fraud detection system for Medical claims using data mining methods. The proposed system uses multilayer perceptron neural networks (MLP). The researchers showed that the model was able to detect 75 fraud cases per month.

Kusaksizoglu et al. [9] introduced a model for detecting fraud in mobile communication networks. The results showed that the Neural Networks methods MLP and SMO found to give best results. In addition, CHEN et al. [10] proposed and

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Plant Leaf Disease Detection System

Using Resnet-50

[1]K.Kavya

Assistant Professor

[2]Ch.Ramya Sai, [3]A.Tulasi, [4]K.Meghana
Andhra Loyola Institute of Engineering and Technology, Vijayawada.

Abstract- ***The identification and detection of diseases of plants is one of the main points which determine the loss of the yield of crop production and agriculture. The studies of plant disease are the study of any visible points in any part of the plant which helps us differentiate between two plants, technically any spots or color shades. The sustainability of the plant is one of the key points that is for agricultural development. The identification of plant diseases is very difficult to get right. The identification of the disease requires lots of work and expertise, lots of knowledge in the field of plants and the studies of the detection of those diseases. Hence, image processing is used for the detection of plant diseases. The Detection of diseases follows the methods of image acquisition, image extraction, image segmentation, and image pre-processing.***

By using proposed system RESNET 50 DL-based technique including the Single Feed-forward Neural Network, Region Proposal Network, and Region-based Fully Convolutional Network has been carried out using a transfer learning technique that focused on an important agricultural problem of plant disease identification. The transfer learning technique is applied due to its successful performance for many object recognitions tasks. From the practical point of view, reuse or transfer of information from previously learned tasks for learning new tasks increases the accuracy of the DL architectures. In this research, we are going to shown the final checkpoints of the detection tools. Moreover, recently, the research community is focusing on better optimization of weight parameters of neural networks. Thereby, in this work, the performance of three state-of-the-art deep learning optimizers was also analyzed, which significantly improved the prediction ability (true positive detection rate) of top selected DL meta-architectures.

Keywords- Convolutional Neural Network, RESNET 50,DL models, Image processing, image acquisition, image extraction, image segmentation, simage pre-processing.

I.INTRODUCTION

India is a cultivated country and about 70% of the population depends on agriculture. Farmers have large range of diversity for selecting various suitable crops and finding the suitable pesticides for plant. Disease on plant leads to the significant reduction in both the quality and quantity of agricultural products. The studies of plant disease refer to the studies of visually observable patterns on the plants. Monitoring of health and disease on plant plays an important role in successful cultivation of crops in the farm. In early days, the monitoring and analysis of plant diseases were done manually by the expertise person in that field. This requires tremendous amount of work and also requires excessive processing time. The image processing techniques can be used in the plant disease detection. In most of the cases disease symptoms are seen on the leaves, stem and fruit. The plant leaf for the detection of disease is considered which shows the disease symptoms. This paper gives the method to identify the disease of a leaf by using Resnet-50 algorithm for finest accuracy and Efficiency.

II.EXISTING SYSTEM

Dhawale Sariputra in 2016 used the plant images and used image segmentation,imageprocessing,image histogram,feature extraction are the mainly used techniques for processing.

Prajakta Mitkal (2016) et al. proposed nowadays many of the farmers and agro help center use the different new technology to enhance the agriculture production.To find out particular disease using Digital image processing helps to find disease and provide prevention for particular disease which types pesticide need to prevent disease.

Sandesh Raut (2017) et al. proposed for increasing growth and productivity of crop field, farmers need automatic monitoring of disease of plants instead of manual.In our proposed work, we developed k-means clustering algorithm with multi SVM algorithm in MATLAB software for disease identification and classification.

Gharte Sneha H. (2019) et al. proposed a task for producing agricultural products, various micro-organisms,

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ECONOMIC SLOWDOWN AND ITS IMPACT ON ECONOMY: A QUALITATIVE STUDY WITH REFERENCE TO INDIAN ECONOMY

Dr. SUBBA RAYUDU THUNGA[1], Mrs. LAVANYA PB[2]
[1]Associate Professor & HoD, [2]Assistant Professor
Andhra Loyola Institute of Engineering and Technology,
Vijayawada, Andhra Pradesh, India

ABSTRACT
Manufacturing sector has been the backbone of all developed and developing nations. In developing countries like India the performance of manufacturing sector over the past few years has been dismal. The objective of this paper was to examine the impact of economic slowdown on economy growth and development. The study reveals causes of economic slowdown and advocates policies, recommendations to improve the performance of manufacturing sector and economy. The study is based on primary and secondary sources i.e. observation, referring existing research studies, Annual Reports of Reserve Bank of India, articles and news paper coverage's. This study would be useful to the policy makers' government as well as other stake holders to strengthen the economy.

Key words: Economic Slowdown, Demonetization, Goods and Services Tax.

INTRODUCTION:
Indian economy has been the fastest growing economy. The gross domestic product growths in the last five years have been supple at an average of 7.5 percent during 2014-15 and 2018-19. However, growth moderated to 6.8 percent in 2018-19 from 7.2 percent in 2017-18, marking it its second consecutive year of slowdown. Today our service sector contributes to 54.13 % while manufacturing sector contributes to 18.32% followed by agriculture which is at 14.39%.

The ongoing slump in the economy has impacted India in a way where the gross domestic product of the country has decreased as low as 4.5 percent in the third quarter of 2020. Many factors are further contributing to the slowdown in the economy like credit crunch in the financial markets, subdued exports due to unhealthy world trading pattern, declined consumer consumption, unemployment creating a grave situation in the country.

Though manufacturing forms an integral part of the industrial sector, its sectoral growth has ranged around 7 percent and its share in gross domestic product has stagnated to around 16 percent. Comparing poorly with peers such as Indonesia (20%), Malaysia (22%), Thailand (27%) and China (29%), the performance of India's manufacturing sector over the past few years has been drab.

The growth of consumer goods production has virtually ground to a halt; production of investment goods is falling. Exports, imports, and government revenue indicators are close negative territory *(Sandefur and Duggan, 2019)*. Monetary tightness *(BalaKrishnan, 2019);* or policy and political uncertainty *(Singh 2019: Basu 2019;* Indian Great Slowdown (*Arvind Subramanian and Josh Felman, 2019)* addressed economic slowdown in India.

OBJECTIVES OF THE STUDY:
1. To provide a conceptual overview of the economic slowdown with reference to Indian Economy.
2. To understand the underlying reasons for the present slowdown in Indian Economy. .
3. To investigate the issues and consequences of economic slowdown.

Voices of Eco-Literature: Critical Essays and Global Perspectives

Candy D'Cunha, Editor
Ken Saldanha, Co-Editor

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Chapter 1

Eco-spirituality in the Works of Toni Morrison

N. Dyva Krupa & B. Karuna

Introduction:

Eco-criticism is an earth-centred approach to literary studies. The term eco-criticism was first coined by William Rueckert in his essay *'Literature and Ecology'- An Experiment in Eco-criticism* (1978). The publication of two influential works written in the 1990's, namely, *The Eco-criticism Reader* (1996) by Cheryll Glotfelty and Harold Fromm and *The Environmental Imagination* (1995) by Lawrence Buell paved the way to Ecocritical studies in literature. Buell defines eco-criticism "as a study of the relationship between literature and the environment conducted in a spirit of commitment to environmentalist's praxis" (The Environmental Imagination, 430).

Cheryll Glotfelty is known as the founder of eco-criticism in the United States of America. Suresh Frederick Avers, in his *Essays in Eco-criticism (*2007) says, "Ecocriticism gives human beings a better understanding of nature" (135). Lawrence Buell, Cheryll Glotfelty, Simon C. Estok, Harold Fromm, William Howarth, William Rueckert, Suellen Campbell, Michael P. Branch and Glen A. Love are some of the celebrated eco-critics.

Eco-criticism has been extended to many different fields like anthropology, psychology, philosophy and theology. Anthropologists feel that there is a connection between culture and geography. Their works are concerned with people's rights to survive, value system and rituals that have helped the culture to develop. In the past, psychologists ignored the

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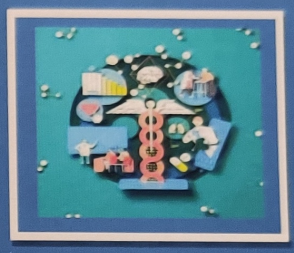

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Covid-19 Lockdown in India: Impacts on The Economy and Key Sectors

Dr. Subba Rayudu Thunga[1] Mrs. Lavanya P B[2]

[1]Associate Professor, Andhra Loyola Institute of Engineering and Technology, Vijayawada, Andhra Pradesh, India,

[2]Assistant Professor, Andhra Loyola Institute of Engineering and Technology, Vijayawada, Andhra Pradesh, India,

Abstract

This paper demonstrates the economic losses in India due to corona virus. The outcome proves that depending on the duration of the lockdown, the Indian economy is likely to face a loss of about 10-31% of its Gross Domestic Product. This study discusses the impact of Covid-19 on various sectors such as manufacturing, financial services, mining& quarrying, construction, agriculture, forestry& fishing. This paper also discusses the impact of covid-19 on Indian exports. This is a secondary research work wherein aim is to study the potential impact of the novel Covid-19 on Indian economy. The methodology adopted includes in-depth review and analysis of various reputed published journals, research works, articles, news paper reports and web sources. The study concludes that economic impact of corona virus is long term and adverse. There is a need to initiate various policy reforms from ground level and mitigate the adverse economic effect of corona virus.

Key words: Covid-19, Economic impact of corona virus, Gross Domestic product, lockdown.

Introduction

Corona Virus was first identified in Wuhan City of China and by the time the severity of the infectious disease made known to the world; it has spread and started showing its impact globally. India is now part of globalised economy and has great connectivity with rest of the world in terms of import and export of goods and services and people migrating in and out for various purposes. India is one among the 200 plus countries which are hit by the pandemic. Inadequate medical facilities, larger population living in villages and remote locations away from minimum medical aids, less infrastructural facilities; the spread of contagious disease would have been more pathetic than anyone can imagine. In the given circumstances, Government of India was left with no option other than to opt for lockdown compromising on economic health for protecting people. The impact of pandemic and subsequent lockdown decision is very high on Indian economy. Various sectors, imports and exports, lives of economically marginalized workers, migrant labour and vulnerable sections of the society have been negatively impacted to note some.

Objectives of the study

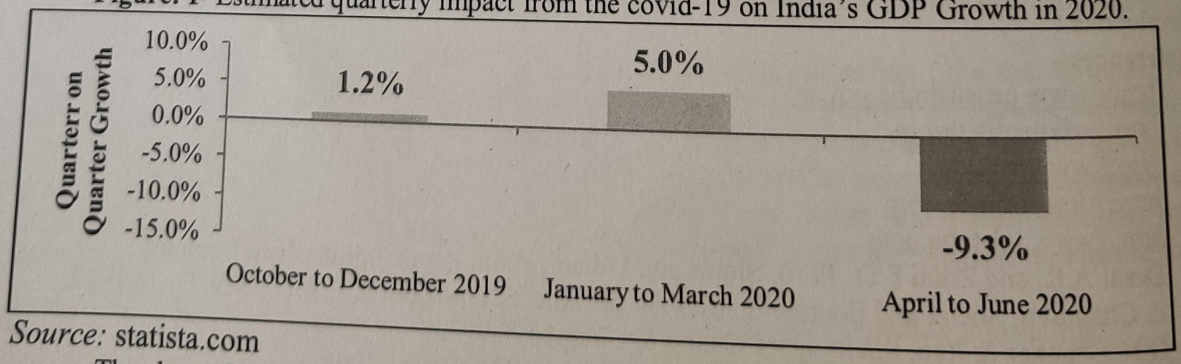
Investigate the impact and economic losses of corona virus on Indian economy. Analyze and discuss the impacts on Gross Domestic Product and key sectors such as manufacturing, financial services, mining& quarrying, construction, agriculture, forestry& fishing and exports.

Methodology of the study

The aim of this paper is to study the covid-19 lockdown in India: impacts on the economy and key sectors. The present study is qualitative as well as analytical in nature. The data sources are review and analysis of various literatures, reputed published journals, working papers, articles, news paper reports and web sources.

Analysis and Discussion

Figure: 1- Estimated quarterly impact from the covid-19 on India's GDP Growth in 2020.

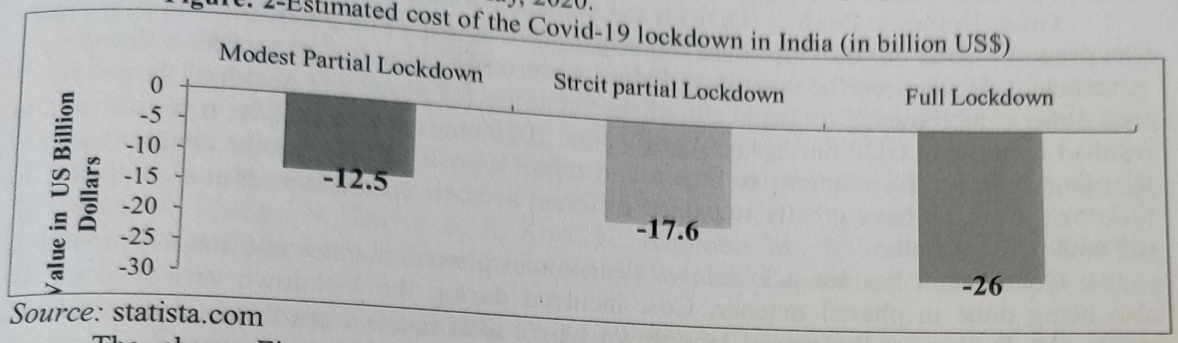


Source: statista.com

The above figure represents the impact of Covid-19 on India's GDP for the last three quarters. During October to December, 2019 GDP was reported at 1.2% and shown an increase with 5% during

the January to March, 2020. Covid -19 has impacted GDP with -9.3% during April to June 2020. During this quarter India was under lockdown restricting its 1.3 billion people mobility and normal course of work from 25th March to 03rd May, 2020.

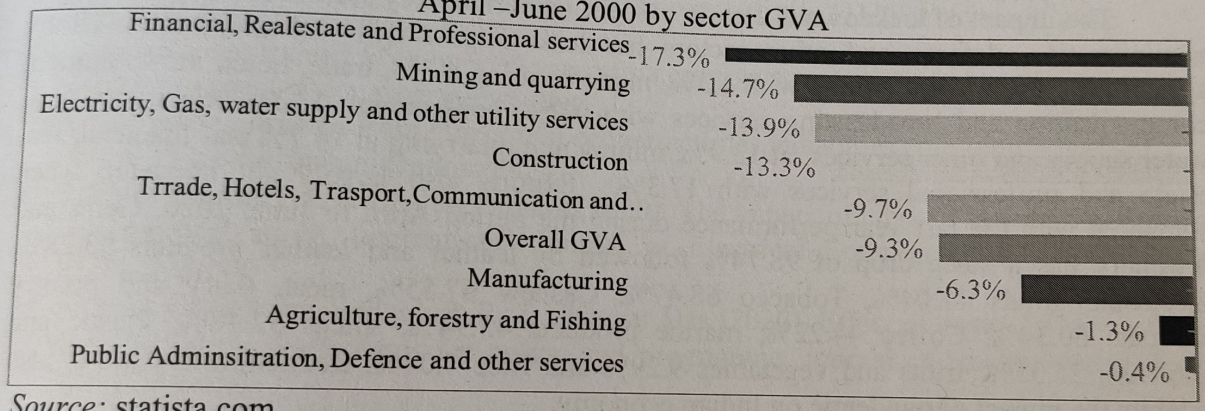
Figure: 2-Estimated cost of the Covid-19 lockdown in India (in billion US$)



Source: statista.com

The above Figure represents the cost incurred by Indian economy because of lockdown decision. The cost incurred by lockdown is US $ 12.5 billion, US $17.6 billion and US $ 26 billion during modest partial lockdown, strict partial lockdown and full lockdown respectively.

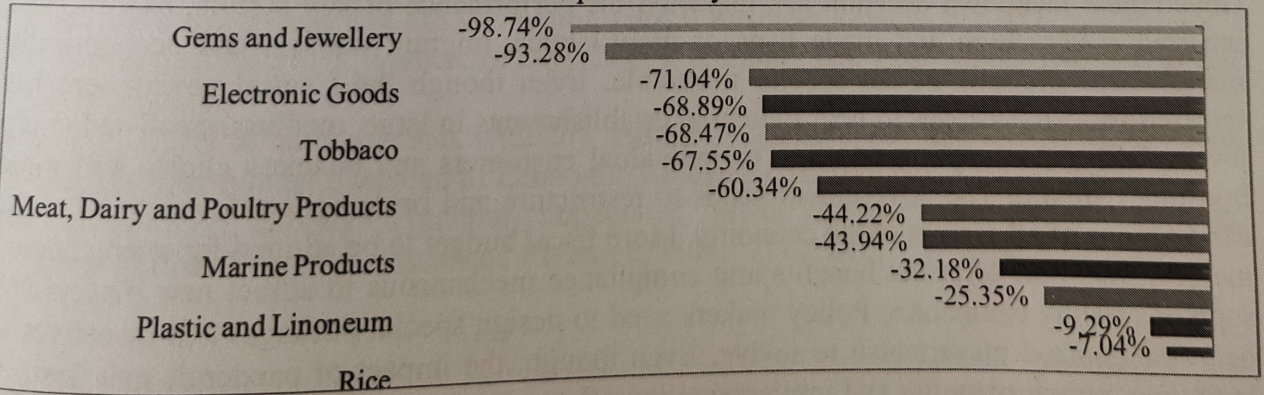
Figure: 3- Estimated growth rate impact from the corona virus on India between April –June 2000 by sector GVA



Source: statista.com

The above figure represents the impact of covid 19 on key sectors in India. All the key sectors were hit badly during the lockdown. The precautionary measures taken by the government even though protected the nation from infectious disease has impacted financial, real estate and professional services with an estimated loss of 17.3 percent

Figure-4: Estimated impact from the corona virus on Indian exports in April 2020 as compared to the same period last year



Source: https://en.wikipedia.org

The above figure depicts the impact of covid -19 on India exports during April-June, 2020 when compared with same period during 2019. Rice export has little impact with reduction of 7.04% but Gems and Jewellery has the highest impact with 98.74% reduction,

the diagram clearly shown the importance of importing countries towards basic needs compared with status and luxury products.

Gross Domestic Product (GDP) is the yardstick which measures the economic health. The present results of GDP represent the impact of Corona Virus pandemic and subsequent government decision on the economy. Indian government was forced to take a decision of lock down compromising on the health of the economy for protecting health of the people. It resulted in negative GDP during the April – June 2020 quarter with -9.3 %. It is estimated to take long time for the economy to regain and report a positive GDP as the consequences of lockdown decision have greatly impacted different sectors and businesses are compelled to run with new normal.

Government has taken lockdown decision in phased manner and unlock process is also being done in phased manner. Cost incurred during the lockdown varied up on the stringency. During modest partial lock down where restrictions were there on some places, mobility of people, transportation and operation of business in selected areas where severity was identified, India incurred US $12.5 billion dollars cost. In strict partial lockdown, some of the states were completed stopped from their economic activities and the cost accounted for US $ 17.6 billion dollars. Full lockdown cost counted US $ 26 Billion dollars with the complete stoppage of all economic activities throughout India.

The impact of lockdown is clearly evident on various key sectors and exports. Public administration, defense and other sectors has least impact with 0.4 drop, followed by agriculture, forestry and fishing with 1.3%, manufacturing 6.3%, trade, hotel, transportation, communication and broadcasting services with 9.7%, construction 13.3%, electricity, gas, water supply and other services at 13.9%, mining and quarrying at 14.7% and financial, real estate and professional services with 17.3%. Exports also largely got impacted when compared with the last year performance during the period April to June, 2020. Gems and Jewellery has a steep drop of 98.74% followed by leather and leather products 93.28%, Electronic goods 71.04%, Tobacco 68.47%, Cashew 67.55%, meat, dairy and poultry products 60.34%, Coffee 44.22%, marine products 43.94%, spices 32.18%, Plastic and linoneum 25.35%, fruits and vegetables 9.29% and Rice 7.04%. Reduction in exports also exhibits the impact of pandemic on Indian economy.

Conclusion

India is a part of the global village and witnessing slow down resulting from international instability for the last one year. The pandemic has worsened the economic conditions even for the advanced countries. Impact in India is more than expected and made technically to enter into recession with the last two quarters negative GDP. The Indian Government lockdown decision has impacted the performance of key sectors, exports, loss incurred is very high and made lives of daily labour, migrant workers and economically marginalized sections of the society miserable. Even though the Central government has released various packages to help Industrial establishments in large, medium, small and micro levels, RBI announced moratorium to individual customers and business clients still more boosting required. The government needs to restructure and bring agile reforms to meet the expectations of all sectors of the economy. More fiscal budget to be allotted for strengthening medical facilities, offer tax benefits and compliance mechanisms to attract new players and support existing companies. Policy makers need to design special packages and incentives to help unorganized players also to revive. Even though, the impact of pandemic may lost for long time, proper planning and implementation of structural reforms from the gross root level will regain Indian economy.

Limitations and scope for Future studies

The present study has certain limitations such as: it considered only secondary source of data and studied only on impact of covid-19 lockdown in Indian economy particularly to

Gross Domestic Product and key sectors in an analytical manner. So in future, researchers can consider primary data and can also consider other sectors in a detailed manner.

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WELCOME FROM THE GENERAL CHAIR

It is a great privilege and honor to be invited to serve as the General Chair (Publications) in the 7th International Conference on *Microelectronics, Circuits and Systems* (Micro2020) to be held during July 25-26, 2020 using online platform in India. Since the COVID-19 pandemic has been impacting us all, we have attempted to organize Micro2020 entirely online so that contactless event may be hold to ensure safety of our life.

The Micro conferences had outstanding scientists serving as past Chairman, General Chair, and I wish to thank them all for the great legacy that has significantly improved the quality of the conference. On behalf of the entire team Micro2020, I would like to welcome all the participants, speakers, delegates in the Micro2020. This conference is committed to provide the scientific community an appropriate platform for presenting the most recent developments and the state of the art not only in the domain of microelectronics, devices, circuits, VLSI and optoelectronics, but also in all other correlated multidisciplinary fields. The Micro2020 will feature presentation of outstanding contributory papers received from various premier institutes in India including Indian Institute of Technology, National Institute of Technology, State and Central Universities, and also from overseas such as United Kingdom, Poland, Serbia, Italy, Ethiopia, and Bangladesh. Although we received a total of 71 submissions, the number of accepted papers has been restricted to only 50 on the basis of reviewers' comments in order to allow good quality paper presentation in the conference, and publication of abstracts in the proceedings. Most importantly, the conference will include deliberations by renowned speakers from different countries including Japan, Poland, Bangladesh, etc. covering the theme of the conference and beyond. Furthermore, you will be happy to learn that extended version of some good quality papers presented in the Micro2020 will be published in Microsystem Technologies, Springer, and other reputed journals subject to completion of further peer-review process as per journal guidelines.

It is again my great honor and pleasure to extend a hearty welcome to everyone attending the Micro2020 and helping to celebrate our 7th year.

Abhijit Biswas
Professor
General Chair (Publication), Micro2020

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July 25, 2020
A message at the
7th International Conference on Microelectronics, Circuits and Systems (Micro 2020),
July 25 – 26, 2020, Delhi, India

Good Morning, Ladies and Gentlemen:
Heartiest greetings and welcome to Micro 2020 conference in historic Delhi, India. Hope you are doing well against the Covid-19 pandemic of this year, by maintaining "social distancing" and "lock down".
For those of you who don't know me, I am Hillol Ray, with the U.S. Environmental Protection Agency (EPA) in Dallas, Texas. It's a great pleasure and unique opportunity for me to connect with you this morning, from half-way around the world. Let me begin by expressing my sincere thanks and appreciations to Professor Dulal Acharjee, and the Organizing Committee of the 7th International Conference Micro 2020. My appreciations and thanks also go to you, the distinguished Speakers, Researchers, Engineers, Designers, Developers, and Scientists, from India and abroad. This event will provide us with an opportunity to network, exchange and share our knowledge, while we attend this Conference of today and tomorrow.
Upon review of the Conference Agenda, I found several significant sessions of special interest to me, such as: Bio-Based Materials and biofuels, Bio and Medical Electronics, Sensors and Applications, and Quantum Information Systems and Devices. These specific areas are intertwined with the fields of Environmental Engineering. The microelectronic wireless nitrate sensors are widely used in agriculture and environmental applications, to study the ions (such as Nitrate). On the other hand, the most common and popular nanomaterials, such as Titania, Carbon nanotubes, and silver nanomaterials have significant applications in environmental remediation, and particularly in water purification. The Research and Development (R and D) Division of EPA continues to explore the benefits through these emerging innovations.
Well, without any further adieu, I like to conclude by wishing all of you and the Conference a great success. Have a pleasant stay and enjoy the historic Delhi and the surroundings.

Hillol Ray

Hillol Ray
Environmental Engineer, Underground Injection Control (UIC)
Enforcement and Compliance Assurance Division
United States Environmental Protection Agency (EPA)
Region 6, Dallas, Texas, USA
Office Phone: 214- 665 -7502
E-mail: ray.hillol@epa.gov

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Reconfigurable Antennas for RFID/WLAN/WiMAX Applications using RF MEMS Switches

Lakshmi Narayana Thalluri[1], K Srinivasa Rao[2], G Venkata Hari Prasad[3], S S Kiran[4], Koushik Guha[5], Appala Raju Kanakala[1], P Bose Babu[1]

[1]Dept. of ECE, Andhra Loyola Institute of Engineering and Technology, Vijayawada, 520008, Andhra Pradesh, India.
[2]MEMS Research Center, Dept. of ECE, Koneru Lakshmaiah Educational Foundation, Guntur, 522502, Andhra Pradesh, India.
[3]Dept. of ECE, CMRCET, Kandlakoya, Hyderabad, Telangana, India.
[4]Dept. of ECE, Lendi Institute of Engineering and Technology, Viziangaram, 535005, Andhra Pradesh, India.
[5]National MEMS Design Center, Dept. of ECE, National Institute of Technology, Silchar, 788010, Assam, India.

ABSTRACT:

In this paper, we have designed and analyzed the performance of reconfigurable antennas for wireless communication applications using RF MEMS switches over the frequency range 0.5 GHz- 7.5 GHz. The proposed reconfigurable antenna is designed with three identical shunt capacitive RF MEMS switches with AlN as a dielectric material. The RF MEMS switch used for the design of reconfigurable microstrip patch antenna is offering good performance i.e., actuation voltage is 4.5 V, switching time is 45 µs. Based on the switching of the RF MEMS switches the antenna is resonating at 0.9 GHz, 1.5 GHz, 3.5 GHz, 5.4 GHz. So, the antenna designed is capable to serve in multiple applications like RFID, WLAN and WiMAX.

Keywords: Electrostatic Actuation, Material Analysis, Reconfigurable Antenna, RF MEMS Switches, Wireless Communication.

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Use of Counting Bloom Filters in Error Detection & Correction

P. Bosebabu[1], T. Pushpalatha[2], T. Kumari[3], A. Beersheba[4]
[1]Asst. Prof, Dept. of ECE, [2,3,4]Students of ECE,
Andhra Loyola Institute of Engineering and Technology
Vijayawada, Andhra Pradesh, India
[1]pbosebabu@gmail.com, [2]tadiboyinapushpalatha888@gmail.com, [3]takukumari2017@gmail.com,
[4]sweety.arumbaka@gmail.com

Abstract: The Counting Bloom Filter (CBF) is useful for real time applications where the time and space efficiency is the main consideration in performing a set membership tests. The CBF estimates whether an element is present in a large array or not. In this paper CBF architecture is analyzed and has been implemented. The CBF is used in many applications like Communication & Networking. The problem with the existing project is, element cannot be removed, and it takes more time for search, and does not produce the result accurately. So, counting bloom filter is designed to reduce the time and it is more accurate. In counting Bloom filters the array of 'm' bits is replaced with an removal integers of 'b' bits and the operation performed here is insertion, query, removal. Here Counting bloom filter is designed by using hash functions.

Keywords: Bloom filter, Counting bloom filter, Hash function, False positive, False negative.

*Corresponding Author
E-mail Address: pbosebabu@gmail.com

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Reduction of Effect of Multiple Hardware Trojans in Cryptoprocessor

P. Bosebabu[1], K. Neeraj[2], B. BhanuPraksh[3], K. Phani[4]
[1,2,3,4]Asst. Prof, Dept. of ECE, 234 Students of ECE, ALIET , Vijayawada
Address: [1]pbosebabu@gmail.com, [2]neeraj312k@gmail.com,
[3]bhanuprakash561999@gmail.com, [4]phani18121997@gmail.com
Andhra Loyola Institute of Engineering and Technology
Vijayawada, Andhra Pradesh, India.

Abstract: Outsourcing IC design and fabrication is one of the effective solution to reduce the design cost but it may cause severe security risks. A hardware trojan is a form of malicious circuitry that damages the function or and trustworthiness of an electronic system. The payload of an hardware trojan is the entire activity that the trojan executes when it is triggered. Malicious trojans try to bypass or disable security fence of a system. It is important to provide security against hardware trojan attacks in electronic systems. Thus, by providing security against these attacks the confidential information can't be accessed by hackers. With the help of our proposed model, we can detect and prevent multiple hardware trojans.

Keywords: Hardware Trojan, Cryptography, IC security, Blowfish Encryption Algorithm, Character Encryption

*Corresponding Author
E-mail Address: pbosebabu@gmail.com

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Reconfigurable Antenna Using RF MEMS Switches Issues and Challenges: A Survey

Mallikharjuna Rao Sathuluri and G. Sasikala

Abstract The reconfigurable antenna provides on-demand services over the present and future communication applications with the help of a RF switches. The features of reconfigurable antenna are offering multiple resonant frequencies depending on the mode of the antenna. The switching is not only possible from one resonant frequency to another; it is also possible to switch from one polarization to other polarization, i.e., circular polarization to linear polarization. This paper discusses about the basic features of microstrip antenna re-configurability, power efficiency, polarization, multipath, inference, fading, and RF distortion. Additionally, the paper describes several key topics related to RF MEMS switch-based reconfigurable patch antenna material analysis. This paper surveys the role and challenges of RF MEMS switches based reconfigurable patch antennas. A little discuss is extended on the PIN diode-based reconfigurable antennas.

Keywords Patch antenna · Re-configurability · RF MEMS switch · PIN diode · FET · Polarization · Bandwidth · Gain · Directivity

1 Introduction

In the history, antennas would take enough space in the communication applications. But still, the role of antenna is significant and expecting the antenna with smart features like re-configurability in terms of frequency and polarization. The switch-based reconfigurable antennas can be designed using different switches like PIN

M. R. Sathuluri (✉) · G. Sasikala
Department of ECE, Vel Tech Rangarajan Dr. Sagunthala R&D Institute of Science and Technology (Deemed to be University), Chennai, Tamil Nadu 600062, India
e-mail: smr.aliet@gmail.com

G. Sasikala
e-mail: gsasikala@veltech.edu.in

M. R. Sathuluri
Department of ECE, Andhra Loyola Institute of Engineering and Technology, Vijayawada, Andhra Pradesh, India

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diodes, varactor diodes, MEMS switches, Field effect transistors, optical controlled switches. The simple reconfigurable antenna can be design by interfacing the two antennas with RF switches. From the literature, it is clear that RF switches based reconfigurable antennas are offering best performance compared with other switches. In this reconfigurable antenna using RF switches, paradigm is facing some real-time challenges like multipath, inference, fading and RF distortion is the major issues will rise, when we try to interface two antennas. PDMS-based high-Q microstrip patch antennas may not offer high radiation efficiency. The antenna radiation efficiency is also an important factor in antenna optimization. Generic algorithms will help to optimize the reconfigurable pixel antennas [1]. Without using the switches also we can design reconfigurable antennas, but the tuning frequency range is very low; the bandwidth offered by this type of antenna is also very low [2]. The general antenna performance characterization parameters are gain, directivity, efficiency, directivity gain, bandwidth, VSWR, spillover loss, taper loss, cross polarization loss, maximum element reflective loss, insertion and isolation losses of RF MEMS switch [3]. In the design of hybrid antenna designs, use of unwanted couplings majorly impacts the radio frequency performance [4]. Different types of switches are used to design electrically and optically reconfigured antennas, i.e.,

- RF MEMS: The switching in the transmission lines is created by placing micro/nano-mechanical structures with the incorporation of electrostatic (or) magneto static (or) thermal (or) piezoelectric actuation methods.
- PIN Diodes: These switches are fabricated sing GaAs technology. No need of mechanical actuation for switching. Offers high switching speed and low isolation compared to MEMS switches.
- Varactors: These are designed using p–n junction diode switches. The varactor capacitance can be change by varying the switching of p–n junction diodes.
- Photoconductive Elements: These switches are optical based. The switch ON and OFF activity is achieved by light of appropriate wavelength. For light, laser diodes are useful.

At low operating frequency PIN diode, varactor diode, photoconductive elements are offering the good performance. But, the operating frequency is above 100 GHz; these switches are not able to reach the expectation. MEMS switches are giving solution for high-frequency operating reconfigurable antennas.

2 Related Work

The re-configurability paradigm is most widely discussed area in both industry person and researcher. The re-configurability in terms of frequency and polarization is the smart sign to fulfill the requirement in present-day communication applications. In this paper, we discuss few challenges and future direction of RF MEMS switches based reconfigurable antennas. In this section, several survey papers are included which is the best of our knowledge. By redistributing antenna, currents with respect to

electromagnetic fields can help to reconfigurable antenna in terms of frequency, polarization or radiation characteristics. Modifications in geometry, electrical behavior are required to design reconfigurable antennas in terms of bandwidth enhancement, change in operating frequency, polarization and radiation pattern.

2.1 RF MEMS Switches

RF MEMS technology is a multidomain concept; the design requires the knowledge on radio frequency, mechanical and electrical domains [2, 3, 5–7]. In 1991, Larson proposed the concept of RF MEMS switches, and later, so many researchers proposed different RF MEMS switches for wide range of communication applications.

The paper [8] proposes a new structure to achieve best insertion losses, multiband RF MEMS switches with minimum actuation voltage. When the switch is in ON state, it is offering an insertion loss of −0.1 dB and return losses of −36.8 dB up to 25 GHz. When the switch is in OFF state, it offers two isolation peaks, i.e., −48. dB at 4.5 GHz and −54.56 dB at 9.7 GHz. A novel structure is proposed with two cantilever structures.

The paper [9] elaborated clamped–clamed structure RF MEMS switch. GaAs is used as a substrate. The air gap is 2.5 μm which is requiring 30 V actuation voltages.

2.2 Reconfigurable Antennas

The paper [2] presents a detailed study about the E-shaped reconfigurable patch antenna using two RF MEMS switches. The paper is concluded that the E-shape antennas will offer more bandwidth compared with other shapes. The proposed switch is for cognitive radio application. The switch off state frequency is in the range 2–2.6 GHz, and the switches on state frequency are in the range 2.6–3.2 GHz range.

The studies of the paper [5] over viewed circular/linear polarization reconfigurable antenna. Circular shape is chosen for the patch antenna. Overall, one RF MEMS switch is used for re-configurability in terms of polarization. The antenna is designed for satellite applications. The antenna frequency is in the K-band region.

The authors [6] presented pixel slot antenna using RF MEMS switch Radant SPST-RMSW101. Overall, the design is incorporated with four switches. Total number of modes is five. Tuning frequency range is 1.56–3 GHz.

The paper [7] proposes dual band circular polarized antenna. The antenna is reflect array (RA) type. The antenna can switch from K-band to Ka-band. The reflection phase of circularly polarized waves is able to control by the switches at 24.4 and 35.5 GHz independently.

The paper [3] overviews reflect array antenna monolithically oriented with ninety RF MEMS switches. Aperture coupled microstrip patch antenna elements are used to pattern a 10 × 10 element reconfigurable reflect array antenna radiates at 26.5 GHz.

The authors [10] presented slot array antenna with RF MEMS. Antenna is designed for X-Band applications. Overall, four switches are used in the design.

The paper [11] proposes three states of polarization with pneumatically controlled reconfigurable antenna. Four PIN diodes are used for design of antenna.

3 Reconfigurable Antenna Using RF MEMS Switches Framework

An antenna with re-configurability feature would enable change of radiation pattern, impedance bandwidth, polarization, operating frequency. The simple method to make single antenna as reconfigurable is by extending its length using matching switches. The switch mismatching may effect impedance bandwidth and operating frequency.

3.1 Polarization

Antenna is an bidirectional energy converter. It converts electrical to electromagnetic and electromagnetic to electrical. The electromagnetic wave consist E-plane and H-plane. E-plane helps to find the type of polarization. There exist different polarizations like circular, elliptical and linear polarization. In RFID application, transmitting antenna needs circular polarization and receiving antenna needs linear polarization.

Linear polarization

If the electromagnetic wave is propagating either horizontal plane or vertical plane, then it comes in the category of linear polarization. If the E-field in the electromagnetic wave is parallel with the earth surface, then we can call it as horizontal linear polarization, and if the E-field is maintaining 90° with earth surface, then it is vertical linear polarization. Linear polarization has demand in C-band and Ku-band applications (Fig. 1).

Circular polarization

Satellite communication highly demands this type of polarization. In this type of polarization, the wave propagates with same frequency and magnitude but the electric field is in the circular shape. The limitation of this polarization is limited range of the RF lose because they splits power across two different planes (Fig. 2).

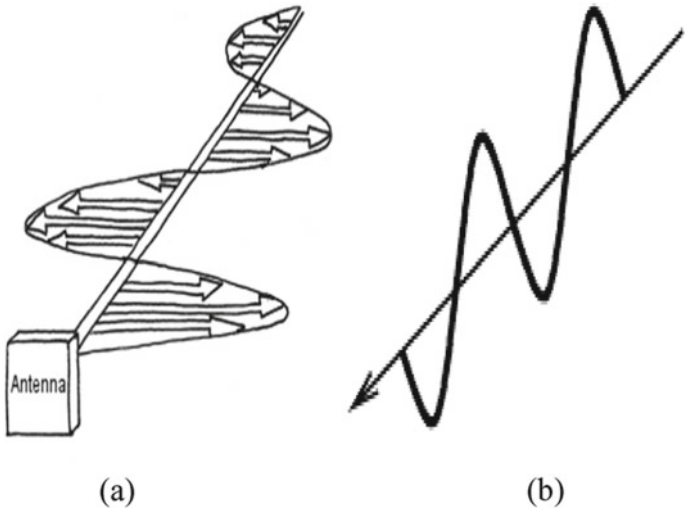

Fig. 1 Linear polarization **a** horizontal and **b** vertical

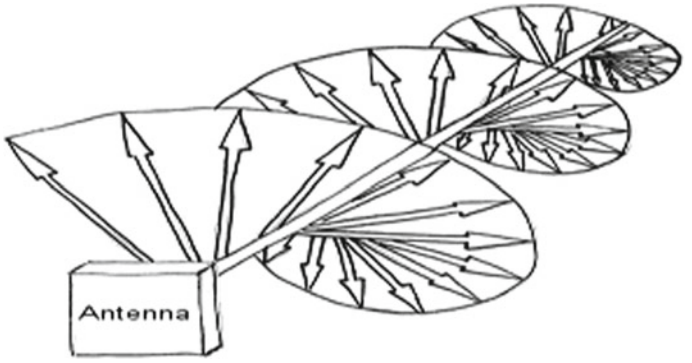

Fig. 2 Circular polarization

Elliptical polarization

It is one mixed verity of circular and linear polarization. In this polarization, the EM radiation is in elliptical shape if we relate with propagation direction. This polarization precisely requires in satellite communication as similar to circular polarization, but the linear polarization is used in regular simple antenna applications (Fig. 3).

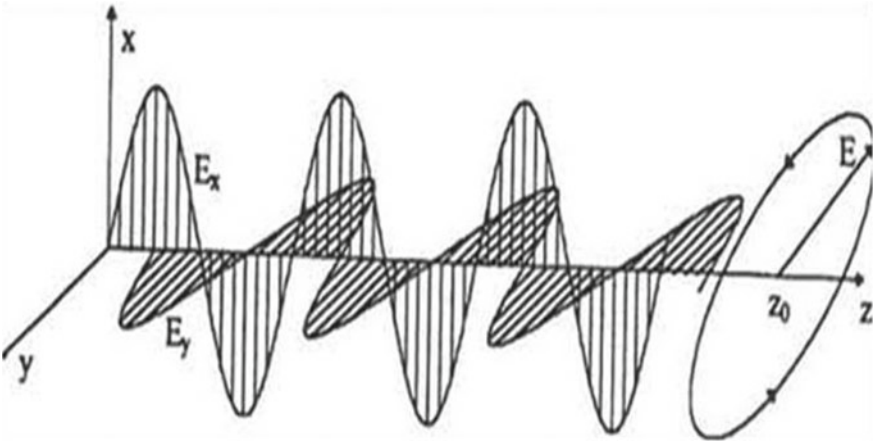

Fig. 3 Elliptical polarization

3.2 Fading

Fading is one of the antenna performance deciding factors. It indicates how the signal is attenuated by depending on time, geographical position and radio frequency. By using random process, we can model the fading phenomenon of the antenna. In practical fading because of multipath, this type of fading is referred as multipath fading. Bad weather is also one reason for fading; it is also referred is shadow fading.

3.3 Interference

Transmitters and electrical systems used in the communication cause interference. It may affect the simultaneous multiple signal reception; sometime, it leads to signal loss. The quality of the signal also depends on the interference property of the antenna.

3.4 Multipath

Because of reflections, the signal receives at antenna in multiple paths. These signal reflections are because of obstacles present in the path of propagation. A communication with high line of sight is preferable; here line of sight refers the single direct path between transmitter and receiver without displacement error as shown in Fig. 4.

If the signal receives with some reflections, it is known as multipath. Achieving the high line of sight, especially in metropolitan cities, is really a challenging task.

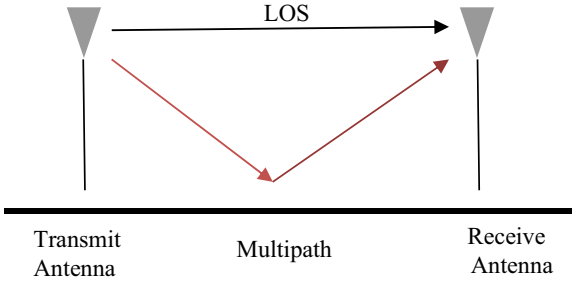

Fig. 4 Multipath in antenna

Signal loss and some phase errors will occur because of multipath phenomenon (Tables 1, 2, 3 and 4).

4 Antenna Basic Measurements

An antenna is basically a transducer. It converts radio frequency (RF) electrical current into an electromagnetic (EM) wave of the same frequency. Any antenna can be characterized with antenna parameters.

4.1 Antenna Impedance

It is defined as the ratio of input voltage to input current,

$$Z_{\mathrm{a}} = \frac{V_i}{I_i}\Omega \tag{1}$$

Here, 'Z_{a}' is a complex quantity, and it is written as

$$Z_{\mathrm{a}} = R_{\mathrm{a}} + jX_{\mathrm{a}} \tag{2}$$

where the reactive part 'X_{a}' results from fields surrounding the antenna. The resistive part R_{a} is given as

$$R_{\mathrm{a}} = R_{\mathrm{l}} + R_{\mathrm{r}}. \tag{3}$$

Here, 'R_{l}' represents losses in the antenna, and 'R_{r}' represents radiation resistance.

Table 1 Comparison of the related work with the survey based on RF MEMS switches, actuation voltage, insertion losses, isolation losses

Survey paper	Year	Topic discussed	RF MEMS switch type	Gap (μm)	Pull in voltage (V)	Isolation losses	Insertion losses
Ramana et al. [12]	2018	Serpentine structure, pull in voltage	Series metal contact	3	4	−67.9714 dB at 12 GHz	−0.094 dB at 12 GHz
Pertin et al. [13]	2018	Bridge structure, pull in voltage	Shunt capacitive	0.6	19	−12 dB	−0.05 dB
Angira et al. [14]	2016	Dual cantilever, insertion losses, pull in voltage	Shunt capacitive	2	12.75	5–17 dB (1–25 GHz)	0.02–0.1 dB (1–25 GHz)
Zhu et al. [8]	2014	High isolation, high power applications	Series metal contact and shunt capacitive	10	62	−50 dB at 5 GHz, −45 dB at 20 GHz and −60 dB at 35 GHz	0.2–0.6 dB (1–35 GHz)
Persano et al. [15]	2015	Bridge structure, GaAs substrate	Shunt capacitive	2.5	30	–	–
Mulloni et al. [9]	2013	Clamped-clamped structure, Influence of temperature on the actuation voltage	Shunt capacitive	2.9	65	–	–
Ghodsian et al. [16]	2008	Cantilever beam, contact force, contact resistance, CPW transmission line	DC contact series	3	48	−39 dB at 5 GHz,−32 dB at 10 GHz	0.1–0.5 dB (1–40 GHz)

Table 2 Extensive survey on effect of antenna shape on bandwidth

Survey paper	Antenna shape	Frequencies	Impedance band width of antenna
Kona et al. [17]	Stacked	Radar application-1.26 GHz Radiometer application-1.4 GHz	±10 MHz ±10 MHz
Jung et al. [5]	Circular with stub	16.9–22.5 GHz	22%
Luk et al. [18]	L-shaped	3.76–5.44 GHz	35%
Huynh et al. [19]	U-slotted	812 MHz to 1.2 GHz	45%
Yang et al. [20]	E-shaped	1.9 and 2.4 GHz	30.3%

Table 3 Comparison of the related work with the survey based on the reconfigurable antenna overview, antenna materials, parametric analysis, antenna features, RF switches

Survey paper	Year	Topic discussed	Antenna shape	Number of switches	Switches	Switches state and resonant frequency	Antenna application
Rajagopalan et al. [2]	2014	RF MEMS switches, Particle swarm optimization, impedance bandwidth, antenna shape	E-shape	2	RMSW 100HP—SPST, high power (10 W), DC-12 GHz	S1 and S2: ON-2–2.6 GHz S1 and S2: OFF-2.6–3.2 GHz	Cognitive radio
Jung et al. [5]	2012	linear and circular polarization, switch packaging, impedance bandwidth	Circle	1	DC contact RF MEMS	S1: OFF-circular polarization (17.4–21.9 GHz) S1: ON-linear polarization(16.9–22.5 GHz)	Satellite
Chiu et al. [6]	2012	Re-configurability with RF MEMS switches	Pixel slot and loop	4	RMSW101—SPST, high power (10 W), DC-12 GHz	All switches: ON: 3.3 GHz S1: ON: 2.5 GHz S1 + S2: ON:2 GHz S1 + S2 + S3: ON: 1.56 GHz S1 + S2 + S3 + S4: ON: 2.42 GHz	Wi-Fi
Guclu et al. [7]	2012	Circularly polarization, reflect array (RA), sequential rotational principal	Split rings	6	Series DC contact RF MEMS switch	24.4 GHz and 35.5 GHz independently	K-band and Ka-band
Bayraktar et al. [3]	2012	Reflect array (RA), phase shift, ACMPA	Aperture coupled microstrip patch antenna	90	Series RF MEMS switch	26.5 GHz	Ka-band
Sánchez-Escuderos et al. [10]	2011	RF MEMS switches, antenna gain	Slot array design	4	RMSW101—SPST, High Power (10 W), DC-12 GHz	10.25 GHz	X-band

(continued)

Table 3 (continued)

Survey paper	Year	Topic discussed	Antenna shape	Number of switches	Switches	Switches state and resonant frequency	Antenna application
Cheng et al. [4]	2009	Antenna-filter-antenna (AFA), Electronically scanned arrays(ESAs), RF MEMS switches	Programmable lens-array antenna	5 switches, 4 modes	Capacitive RF MEMS switches	35 GHz	Ka-band
Jung et al. [21]	2008	RHCP, dual frequency, high-frequency ratio, VSWR perturbation stub	Square shape	1	Series RF MEMS switch	S1 ON—4.8 GHz S1 OFF—7.6 GHz	C-band
This survey		Overview of reconfigurable antenna, design issues, parametric issues, future challenges, material analysis	–	–	–	–	–

Table 4 Extensive survey on reconfigurable antenna with PIN diode

Survey paper	Topic discussed	Antenna shape	Number of PIN diodes	Number of operating modes	Mode and operating frequency	Application
Wu et al. [11]	LP/LHCP/RHCP and LP/orthogonal-LP/LHCP/RHCP	Circular	4	2	2.42 GHz	Cognitive radio
Wang et al. [22]	Magnetic current	Series of rectangular antennas	2	3	M1:D1-ON,D2-OFF:Directinal status 1, M2:D1-OFF,D2-ON-:Directional status 1, M3:D1-OFF, D2-OFF-Bidirectional	WiMax
Alam et al. [23]	Reconfigurable band rejection antenna	Stub and slot/diodes	3	4	*M1:D1-ON,D2-OFF,D3-OFF = 3.5 GHz* *M2:D1-ON,D2-ON,D3-ON = 5.5 GHz* *M3:D1-OFF,D2-OFF,D3-OFF = 7.5 GHz* *M4:D1-OFF,D2-ON,D3-ON = 9.5 GHz*	WiMax wide local area network (WLAN) and ETSI HiperLAN/2

4.2 Directivity

The directivity (D) of the antenna is the ratio of the amount of energy transmitted in the direction with the strongest power to total amount energy transmitted in all directions.

$$D = 4\Pi \frac{U_{\max}}{P_{\text{rad}}} \tag{4}$$

4.3 Efficiency

For antenna, the complex impedance is $Z_{\text{ant}} = R_{\text{ant}} + JX_{\text{ant,}}$ where R_{ant} is the antenna resistance; it is a combination of radiation resistance (R_{rad}) and dissipation resistance (R_{diss}). The antenna phasor current $I_{\text{o}} = I_{\text{s}}e^{\text{j}}$, and the radiation power is $P_{\text{rad}} = (1/2)I_{\text{o}}^2 R_{\text{rad,}}$ the dissipation power is $P_{\text{diss}} = (1/2)I_{\text{o}}^2 R_{\text{diss}}$. From the radiated power and the dissipated power, we can write the expression for antenna efficiency i.e.,

$$E = \frac{P_{\text{rad}}}{P_{\text{rad}} + P_{\text{diss}}} \tag{5}$$

4.4 Gain

The ability of direct the input power into radiation in a particular direction is measured with the antenna gain. It can be expressed in terms of antenna efficiency and directivity as follows:

$$G = \text{Efficiency} * \text{Directivity} \tag{6}$$

4.5 Bandwidth

The antenna bandwidth can be expressed as the range of frequencies over which an antenna meets a published performance requirement.

$$\text{Bandwidth} = f_2 - f_1 \tag{7}$$

where 'f_1' is the lower cutoff frequency and 'f_2' is the uppercut of frequency. The impedance bandwidth is nothing but the fractional bandwidth; the expression for impedance bandwidth is

$$\text{Impedance Bandwidth} = \frac{2(f_{\max} - f_{\min})}{(f_{\max} + f_{\min})} \times 100 \tag{8}$$

4.6 VSWR

Voltage standing wave ratio (VSWR) is one of the antenna performance indices which will help to measure the antenna efficiency in the transmission of radio frequency power, by using transmission line, into a load. If the VSMR value is one, it indicates that there are no signal reflections. If the VSWR value is above one, it indicates that signal reflections are significantly increasing. The VSWR can be expresses as

$$\text{VSWR} = \frac{1 + \Gamma}{1 - \Gamma} \tag{9}$$

where 'Γ' is the reflection coefficient.

4.7 Return Losses

The return loss is the ratio of the input signal power to reflected signal power. It is usually expressed as a ratio in decibels (dB). Antenna with return loss below −10 dB is acceptable. The antenna return loss can be expressed as (Table 5)

$$\text{ReturnLosses} = 10 \log_{10} \frac{P_{\text{input}}}{P_{\text{reflected}}} \tag{10}$$

5 Material Selection

Materials or medium that are homogenous, linear and isotropic are called simple materials or media. There are three different types of materials which are of much use in EM theory which are conductor, dielectric and magnetic. A good conductor is defined as a material having electrical parameters $\varepsilon_{0,}\ \mu_{0,}\ \alpha \gg \omega\varepsilon_0$ at operating frequency $f = \omega/2\pi$ below optical region. In general, we can use Au or Cu as conductors. In antenna, substrate acts as dielectric material. The substrate material properties

Table 5 An extensive survey on frequency bands and respective applications

Frequency band	Frequency range	Application
L-band (1–2 GHz)	1–2 GHz	Long-range air traffic control and surveillance (radar), GPS
S-band (2–4 GHz) and C-band (4–8 GHz)	3.3–3.6 GHz; 5.25–5.825 GHz	IEEE 802.16-WiMax Cognitive radio
C-band (4–8 GHz)	5.15–5.35 GHz; 5.725–5.825 GHz	IEEE 802.11a—wide local area network (WLAN)
C-band (4–8 GHz)	5.15–5.35 GHz, 5.47–5.725 GHz	IEEE 802.11a—ETSI Hiper LAN/2
X-band (8–12 GHz)	7.25–7.75 GHz	Fixed and mobile satellites
	7.75–7.9 GHz	Fixed satellite
	7.9–8.4 GHZ	Fixed earth exploration satellites
	8.5–10.5 GHz	Radio location
	8–12 GHz	Synthetic-aperture radar (SAR)
Ku-band (12–18 GHz)	12–18 GHz	Direct broadcast satellite, DHT television
K-band (18–27 GHz)	18–27 GHz	Surface movement radars
Ka-band	27–40 GHz	Surface movement radars
V-band	40–75 GHz	High attenuation radar applications
W-band	75–110 GHz	High-frequency radar

will show major impact on the performance indices of the antenna in terms of operating frequency, efficiency and bandwidth. So selection of the antenna materials is also very important. List of different substrate materials is listed in Table 6. The feed line width is proportional to substrate thickness and inversely proportional to dielectric constant. The antenna impedance locus is more inductive when the thickness of the substrate material and inductance of the feed line is increased.

6 Conclusion

The survey on the reconfigurable antenna using the RF MEMS switches is presented in this paper. The challenges in the design of reconfigurable antenna are fading, multipath, inference, switch mismatching. By using RF MEMS switches, we can design antennas with reconfigurable polarization or reconfigurable operating frequency. The reconfigurable antennas can be designed without using the switches, but the frequency is in the low range. The RF MEMS switches based antennas will offer high tuning frequency. RF MEMS switches can operate at high power, and the power consumption is very low; this feature attracts the future research on reconfigurable antennas using RF MEMS switches.

Table 6 Substrate materials for patch antenna

Substrate	Dielectric constant	Size radiation	Bandwidth
Benzocyclobutane2	2.6	Medium	Medium
Duroid 6010	10.7	Lowest	Minimum
Nylon fabric	3.6	Medium	Medium
Roger 4350	3.48	Medium	Medium
RT-Duroid	2.2	Medium	Medium
Foam	1.05	Highest	Maximum
FR-4	4.4	Medium	Medium
Nylon 610	2.84	Medium	Medium
Fused Quartz	3.78	Medium	Medium
Beryllia	6.4	Lowest	Minimum
TMM 10	9.2	Lowest	Minimum
Silicon	11.9	Lowest	Minimum

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HEAD MOTION DETECTION

DR. A. Srinivasa Rao [1], M.Prathyusha[2], Y.Rajeswari[3]

Department of Computer Science and Engineering,

Andhra Loyola Institute of Engineering and Technology,

Jawaharlal Nehru Technological University – Kakinada

[1] Professor CSE Department akella.srinivas08@gmail.com

[2]murariprathyusha1999@gmail.com

[3]rajeswariyaragani@gmail.com

I. ABSTRACT

The proposed system is a system which can be used for surveillance and monitoring applications. The development of an efficient real time video head detection system is motivated by their potential for deployment in the areas where security is the main concern. The proposed system presents a platform for real time video head detection and subsequent generation of an alarm condition as soon as the human head is detected. The prototype consists of a platform mounted with camera which provides continuous feedback of the online exam environment.

Keywords: Machine Learning

II. INTRODUCTION

Now-a-days several problems exist in human head motion analysis and this includes: Unable to provide an optimal method of dimensionality reduction to achieve higher recognition rate.10 Human head motion tracking cannot be done (from the training set) by combining the Eigen faces alone. The weighting factors need to be more adaptive to achieve better results. Less scalability exists for detecting human head motion. Image block matching, gradient constraints, phase conservation or energy models are bottlenecks.

Intelligent video surveillance systems are receiving a great deal of interest especially in the fields of personal security and assistance. These systems are built in order to accomplish several tasks from detection of human presence to recognition of their activities. In the past few decades, vision-based surveillance has been extensively applied on industrial inspection, traffic control, security systems, and medical and scientific research. One of the application areas of video surveillance is monitoring the safety of elderly in home environments. In the case of elderly people living on their own, there is a particular need for monitoring their behaviour, such as a fall, or a long period of inactivity. Fall in the elderly is a major public health problem and may lead to injury, restricted activities, fear or death. A fall incident not also causes many disabling fractures but also has dramatic psychological consequences that reduce the independence of the person. It is shown in that 28-34% elderly people in the community experience at least one fall every year, and 40-60% of the falls lead to injury. Human society is experiencing tremendous demographic changes in aging since the turn of the 20th century. ability of helping elderly people. Nowadays, the usual solution to detect falls is wearable sensors [These autonomous sensors are usually attached under the armpit, around the wrist, behind the ear's lobe or at the waist. Moreover in the case of noncontact sensors, they often provide fairly crude data that's difficult to interpret. Although, computer vision systems try to extract some considerable features from video sequences of movement patterns to detect falls. The data provided by cameras are semantically richer and more accurate than standard sensors.

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NARASARAOPETA ENGINEERING COLLEGE, NARASARAOPET- 522 601,
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Door Security System Using Face Recognition

Dr. A. Srinivasa Rao[1], K.G.J.Prasanth[2], M. Rama Rao[3]

Department of Computer Science and Engineering,
Andhra Loyola Institute of Engineering and Technology,
Jawaharlal Nehru Technological University - Kakinada
[1] Professor CSE Department akella.srinivas08@gmail.com
[2]kotalakshmiganesh@gmail.com
[3]mandaramarao28@gmail.com

***Abstract*— In today's era of automation and smart devices, there is crucial need to alter the security measures of system as privacy and security are notable issues in the information system. It is difficult to trust blindly on traditional and simple security measures of the system. In traditional system many of the doors are having mechanical lock which were restricted on the number of keys. This article proposes Smart Door Unlock System based on Face Recognition to enhance the security. In this system camera sensor is used to capture the face and image matching algorithm will be used to detect the authenticated faces. Only the person whose face is matched can be able to unlock the door. So, limitation of managing keys will be resolved. Only the person whose face is matched can be able to unlock the door. So, limitation of managing keys will be resolved. The security system is also made by means of maintaining into the eye of old age humans for whom it is hard to open the door manually. This system will not only enhance the security but also make the system keyless. Proposed system will be robust from hacking attacks as we are proposing machine learning based approach.**

***Keywords*— IOT, Face Recognition, Machine Learning, Smart Door Security.**

I. INTRODUCTION

Now-a-days with the extreme use of smart devices are used to automate many of the processes. Home automation is one of the aggressively developed technology use by high end society. It's far tough to consider blindly on traditional and simple security features of the device. in conventional gadget many of the doors are having mechanical lock which have been constrained on the number of keys. So, to overcome the aforementioned issues and traditional locking system one has to modify them and make them smart and automated. It works well but when we wish more secured environment and accountability of who locked and unlocked when is the major part was missing in traditional system.

This paper proposes Smart Door Unlock System based on Face Detection to enrich the security. Machine learning based approach is proposed in the paper. In this system camera sensor will be used to capture the face and image matching algorithm will be used to detect the authenticated faces. Only the person whose face is matched can be able to unlock the door. So, limitation of dealing with keys will be resolved. This system will now not best beautify the safety however additionally make the device keyless. Many promising digital based automated solutions came in market whose detailed analysis is given in literature survey, a few are thumb based, Iris based and Face Based. Many people tried to develop the automation on door based on smart card thumb based, iris based but very few of them are prominent for face based solution .

This system is so promising but has its own pros and cons. certain challenges are also faced when we use face detection such as lightening, varying brightness. The main advantage of this system is acquiring the door using face detection approach and entire face is recognized. Face recognition technique involves attribute extraction from facial image with help of smart door model an intense innocence is expected in security industry and to make daily objects synergistic..

II. ABOUT THE PROPOSED WORK

A. Literature Survey

We have discovered various papers identified with the security framework. The author in [1] proposed a novel approach of face recognition which based on Gabor filtering and supervised classification. The 2D filter bank are used and then produces 3D robust face for vector average distance used in supervised classifier and threshold based face verification