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IMAGE CAPTION GENERATION

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Abstract - The ability to train a machine accurately to describe a picture or a human-like environment has a profound effect on robot, business, and various other fields. Throughout the ages, automatic interpretation of images has been a daunting task in the field of artificial intelligence. In this paper, to obtain image captions we use a Convolutional neural network based model for feature extraction and recurrent neural networks to generate text from features. We also added text to speech functionality and implemented this to a Django-based web application.

Keywords— *Image caption generation, Gated recurrent units (GRU), InceptionV3.*

I INTRODUCTION

Being able to automatically describe image content using well-structured English sentences is a very challenging task, but it can have a huge impact, for example by helping visually impaired people better understand the content of images on the web. The description should not only capture the content of the image, but should also reflect how these objects relate to their surroundings involved. In addition, the semantic information above should be expressed in a natural language such as English, which means that a language model is needed in addition to the visual comprehension. The major use case of such projects is for e-commerce websites, where it can accurately caption the product and help improve search queries. It can also be used for generating common descriptions for complex art works in art museums. The text to speech feature can be used by visually impaired to generate caption of nearby object, thereby helping them navigate easily.

II. LITERATURE SURVEY

Feng, Y., & Lapata, M. Automatic generation of captions for news images. *IEEE Transactions on Pattern Analysis and Machine Intelligence*, In this case, the system automatically generates captions for news articles. Captions are generated from a database of various news articles and an embedded image. This model consists of two phases of material collection and space acquisition. Content selection means that the image and the accompanying article are about, and the above information determines how the selected content should be conveyed. Vijay, K., & Ramya, D. Generation of caption selection in news images using a stemming algorithm. This paper, introduces a model that automatically

generates captions for articles with an embedded image. Captions of news articles are generated using the stemming algorithm and frequency calculation. Ramnath, K., Baker, S., Vander Wende, L., El-Saban, M., Sinha, S. N., Kannan, A., Torres ani L. AutoCaption: Automatic Reproduction of Captions The frame is designed to help mobile users create captions for their photos. Users should upload an image to a cloud service where the range of compatible modules, such as face detection, GPS, time of day, scene recognition, is used to identify different people and relationships. Output modules are integrated to form a large caption of captions. Deep Visual Synthesis-Semantic Production of Image Image Model can automatically render captions to rendered images using multimodal RNN. Karpathy, A., & Fei-Fei, L. Deep Visual Semantic Coordination of Production of Image Definitions. *IEEE Transactions on Pattern Analysis and Machine Intelligence*. This model aligns caption sentences with visual regions that describe the embedding of multiple paths and uses this as an input into a multimodal RNN that will generate captions. Vinyals, O., Toshev, A., Bengio, S., & Erhan, D. show and tell: A neural image caption generator. 2015 *IEEE Conference on Computer Vision and Pattern Recognition*. In this presented model is based on concept. 'Show and Tell'. This model used CNN and LST to create captions. This model was implemented using various data sets to obtain more accurate results. Drossos, K., Adavanne, S., & Virtanen, T. Automatic audio captions with standard sensory networks. In the proposed model, it takes the input as an audio file and converts it into text. Conversions are done using an encoder-decoder scheme with a layer of attention in between. The method was tested using

commercial commercial data, each associated with the description of the text (captions) within the database. Poghosyan, A., & Sarukhanyan, Interim HS memory with only reading unit in neural caption generator. The automated caption generating model was implemented using Recurrent Neural Network and LSTM with Read-Only units. This model is trained in the MSCOCO database that produces more accurate captions using all of these technologies together.

III. SYSTEM DESIGN AND ARCHITECTURE

Figure 1 depicts the block diagram of an image caption generation model.

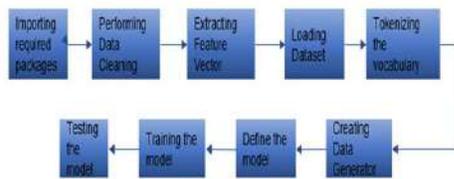


Fig. 1. Block diagram of image caption generation model

WORKING

After the user uploads an image, we start with importing necessary packages, like NumPy, keras etc. Data cleaning is performed on the data where redundant words like a, is, the are removed. We extract features using a pretrained inceptionV3 model which is a CNN model consisting of 48 layers and trained over more than ten million images. The first few layers are responsible for extracting low-level features like edges, colors etc. while the last layers are responsible for extracting specific features related to the image. The dataset we are using is Flickr8k dataset which consists of 8000 images among which 6000 are used for training while 2000 are used for testing. Machines are not familiar with complex English words so, to process model’s data they are numerically represented. That’s why we map every word of the vocabulary with a separate unique index value with a function from the keras library. For training the model as a supervised learning task we need to feed it with input and output sequences. Total 6000 images with 2048 length feature vector and the caption represented as numbers are present in our training sets. It’s not possible to hold such a large amount of data into memory so we are going to use a generator method that will yield batches.

•Feature Extractor –With a dense layer, it will extract the feature from the images of size 2048 and we will decrease the dimensions to 256 nodes.

•Sequence Processor – Followed by the LSTM layer, the textual input is handled by this embedded layer.

•Decoder – We will merge the output of the above two layers and process the dense layer to make the final prediction.

After defining our model, we will generate the input and output sequences to train our model with 6000 training images. We create a function named model.fit generator() to fit the batches to the model. At last, we save the model to our model’s folder.

IV. SOFTWARE IMPLEMENTATION

The following project is initially performed in Google Colab. The instances of this program are integrated in a Django based webapp which provides us a user-friendly interface to upload images and generate captions without being involved in the backend.

Frontend- HTML, CSS, JavaScript.

Web Framework-Django (Python)

Backend- Python.

Platform Used – Visual Studio code and Google Colab.

V. HARDWARE IMPLEMENTATION

Device Used – Laptop

Processor Information- Intel i3

RAM used- 4.00 GB

Image Caption Generator

Please upload your image

Choose File 252802010...7bee500.jpg Generate Caption



Caption for Image is:

two dogs play in the grass

Image Caption Generator

Please upload your image

Choose File 35506150_cbb6f304f.jpg Generate Caption



Caption for Image is:

man in red shirt is sitting on bench

Image Caption Generator

Please upload your image

Choose File 241345323..._ob5eec4.jpg Generate Caption



Caption for Image is:

the baseball player is playing baseball

VI. TESTING AND RESULTS

BLEU stands for Bilingual Evaluation Understudy. The BLEU score is a value between 0 and 1 indicating how closely the translated text corresponds to a set of high-quality reference sets. The closer the score is to 1.0, the better the caption generated. Due to limited processing power, within 12 epochs, we have acquired an average BLEU score of 0.506468, which indicates that more than fifty percent of the generated captions are accurate.

VII. FUTURE SCOPE

The system can be implemented further for companies like Amazon and Flipkart for generating automatic captions for their products. Semantics can be improved. A minimalistic device can be built using raspberry pi which includes captioning of surrounding images and speaking out the captions for visually impaired people.

VIII. CONCLUSION

In this overview, we have compiled all aspects of the image caption generation task. We have presented an end-to-end neural network that can automatically view an image and generate a reasonable description in plain English. It is based on a convolution neural network that encodes an image into a compact representation, followed by a GRUs (Gated Recurrent Units) that generates a corresponding sentence. The model is trained to maximize the likelihood of the sentence given the image.

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OPEN ACCESS INTERNATIONAL JOURNAL OF SCIENCE & ENGINEERING

SMART ATTENDANCE MONITORING SYSTEM

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Abstract - Face Recognition is a competent computer application for detecting, tracking, recognizing or verifying human faces from images or videos captured by digital cameras. Much progress has been made in the field of facial detection and recognition for security, identification, and presence purposes, but problems still stand in the way of progress toward reaching or exceeding human grade accuracy. These problems are variations in the shape of the human face such as; changing lighting conditions, noise in face photos, proportions, poses, etc. For recognition of the face, it is using a support vector classification algorithm on facial features obtained by LBP to recognize the face and mark its attendance. A digital ecosystem is developed in which the teacher is the administrator of the Android application and the SMS service is implemented to notify parents of absent students.

Keywords— *Face recognition, Face detection, HAAR Cascade, LBPH, SVM, Attendance Monitoring*

I INTRODUCTION

The human face is a complex multidimensional structure that can convey a lot of information about an individual, including expressions, emotions, and facial features. Effective and efficient analysis of information related features on faces is a difficult, time- and effort requiring task. Recently, many face recognition based algorithms for automatic attendance management have been proposed and new algorithms are developed or some existing algorithms are improved or combined with other methods and techniques. algorithm or other algorithm for building a system or application of facial recognition. Maintaining attendance is very important in all learning settings to monitor student performance. In most educational institutions, student attendance is recorded manually using attendance sheets issued by department heads as part of the policy. The students sign in these sheets which are then filled or manually logged in to a computer for future analysis. This method is tedious, time consuming, and inaccurate as some students often sign for their absent colleagues. This method also makes it difficult to track the attendance of individual students in a large classroom environment. In this work, the design and use of face detection and recognition system to automatically detect students attending a lecture in a

classroom and mark their attendance by face recognition. While other biometric methods of identification (such as iris scans or fingerprints) are more accurate, students usually have to queue for along at the time they enter the classroom. Facial recognition was chosen for its familiar and non-intrusive nature, as people primarily recognize others based on their facial features. This biometric (face) system includes a registration process, where a person's unique facial features are stored in a database, followed by identification and verification procedures. In it, faces detected in an image (obtained by the camera) are compared with previously stored faces taken at the time of registration.

II. LITERATURE SURVEY

As part of this work, a survey was conducted on some existing technologies. The literature survey presents an overview of the Smart Attendance Monitoring System. In paper [1] the authors work on face recognition by Advanced Learning Technologies (ICALT) Smart Attendance Monitoring System (SAMS). He proposed better accuracy of the face-log generation technique. All he did was first detect the face using Viola & Jones' idea and then, he used the correlation tracker from the dlib library to keep track of the face from frame to frame. This helps to generate a face-log i.e, a concise representation of the face of the subject in

a video sequence. In [2]; the authors proposed a Cloud-Based Class Attendance Record System. The system is called CBCA System which provides 100% accuracy in recognition. To get the accuracy, Baidu cloud AI is used to do face training/registration and recognition. The application is developed for Wenzhou Kean university and successfully tested by professors which is efficient and easy. It also includes Voice Synthesis Module which starts to work when a face is successfully recognized, the module will automatically synthesize an MP3 file that speaks the student's name and is played to notify the student. In [4] proposed the use of Eigenvector and Eigenvalue for designing a face recognition system. Besides using these, the system was also able to prevent the fake attendance mishap by implementing clock time. It is used for checking whether the student was there in the class for the whole time or not. The proposed system has many upsides but the accuracy of recognition of faces is high only for the frontal face of the student. In [5] the authors use PCA and ANN for facial recognition. They first apply the PCA algorithm for training data and reduce its dimensionality and then use ANN to classify these input data which then helps to find the pattern. The result they concluded is that the accuracy is high due to the combination of PCA with ANN as ANN used for classification is more accurate than PCA with Eigen face.[6] The authors use PCA with Histogram due to which additional noises were removed from the data. The proposed system provides better accuracy due to the implementation of the Ada-Boost algorithm for Face Detection. In addition to this skin, classification was also utilized for improving the precision of the system. In [7] [8] and [9] the system uses the Viola-Jones algorithm for face detection and the PCA algorithm for face recognition. In [10] authors proposed the exploitation of natural symmetries (mirror images) in a well defined family of patterns (human faces) expansion. This results in an extension of the data and imposes even and odd symmetry on the eigen functions of the covariance matrix, without increasing the complexity of the calculation. The resulting approximation of faces projected from outside of the data set onto this optimal basis is improved on average.

III. SYSTEM DESIGN AND ARCHITECTURE

The block diagram indicates a system that is primarily used in educational institutes and universities or workplaces for marking the attendance or maintaining the record of the attendance. The system provides different features like capturing a n image, detecting face, obtaining facial features for recognition, and finally marking the attendance. Attendance data is stored in the mobile app. If the student is absent, parents will get an SMS for the

absenteeism of his child. Teachers can check the attendance of students from the mobile app.

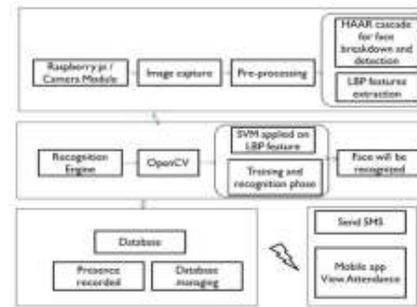


Figure 1: Block Diagram of the system.

A. Image capture

The first block of the system is raspberry Pi module which consists of a Raspberry Pi and a camera. This module is used for capturing the image through a camera and storing the data of the images in Raspberry Pi for further operations. The image captured by this module is pre-processed like removal of noise normalization and converted to grayscale for further operations.

B. Detection of face

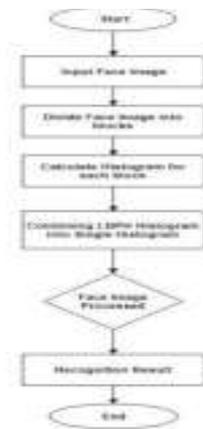
To obtain the facial features from the image for recognition the system first needs to detect the face from the image. Hence for the detection of face Haar Cascade classifier is implemented. It primarily uses Haar features which are rectangular integral and classifier which is trained by providing the positive and negative image of the desired objects. In this system, the classifier is obtained from OpenCV.



C. Extracting LBP Features

LBPH is an algorithm used to represent the characteristics of the original image or to obtain the image in terms of simple data vector form. After converting the image into grayscale and detecting the face from the image operation of LBP takes place. For the LBP algorithm, a dataset needs to be trained for which the facial features are to be obtained. In the case of a biometric system, a dataset of a particular candidate should be provided. Then to find a binary pattern it first obtains a grayscale window then it gives the respective

grayscale value to the window which ranges from (0-255). Then after by considering a threshold value, it compares it with a neighboring pixel. If the pixel is greater than the threshold value it gives it 1 and if it is less than the value it gives it 0 in this order it will obtain the binary pattern of the image.



For Algorithm 2 (Local Binary Pattern Features)

D. Recognition of Input face

For recognition of the face, the system uses a support vector machine algorithm. The algorithm SVM is machine learning- based and it is majorly used in classification problems. SVM works on choosing extreme points in the data vector eventually creating a hyperplane to categorize the data in their respective category. The data points which are closer to the hyperplane affect more the position of the hyperplane and hence it is also called a support vector. In this system after obtaining LBP features from the data set of the detected face, SVM is applied to these LBP features to the input image. After that, it generates a hyperplane with the help of support vectors and eventually recognizes the image.

E. Marking attendance and managing database

For marking the attendance, the system uses the CSV python module. A CSV or Common Separated Values which is a type of file format which is used to store data in tabular format or spreadsheet format. In order to manage attendance panda’s python library is used along with the CSV module. The attendance is stored in the path directory provided by the user in the form of a spreadsheet.

F. Mobile App View Attendance and Message Module
 Teachers can check the attendance of students from the mobile app. If any student is absent, their parents will get an SMS about the absenteeism of their child.

IV. HARDWARE IMPLEMENTATION

In hardware implementation, it consists of Raspberry Pi Model B, which is the computing device. It is mainly used for running the algorithms which are based on concepts of image processing. Also, it is used in managing the database

of various candidates. Along with the Raspberry Pi, the system consists of a webcam for capturing the image and a monitor which is used by the user to operate the system.

V. SOFTWARE IMPLEMENTATION

The software implementation which is used to design the system is primarily python based. In order to implement an image processing-based algorithm using Python, Open CV libraries are used and for storing the attendance is done using the spreadsheet. A mobile app is designed using MIT App Inventor. A Message module is implemented using Fast2SMS API.

VI. TESTING AND RESULTS

The first module of the system deals with the detection of face. For this OpenCV, Libraries are used in the system. The system uses a Haar cascade classifier which works on Haar features for face detection. A rectangular window is provided to the classifier for detection and obtaining the detected face in a grayscale image. The classifier is in the format of .xml file. For face detection. It is frontalface_default.xml and for haaracascade_eye.xml file for eye detection.



Figure 2(a):Face Detection



Figure 2(b): Face Captured

In the next module in order to obtain the LBP Features of the image the LBP classifier needs to train. LBPH algorithm classifier can be obtained from OpenCV for the training of the classifier a data set of the images of detected faces are provided. For a particular candidate, the data set of 100 images are to be taken. The detected faces are stored in an array of names and with a particular ID. In this system, the classifier is provided with this array of names and IDs and stored in .yml format. The result of this module is represented in Figure 3. After creating the data set of LBP features the system needs to recognize the input image by

comparing it with images present in the data set. For this purpose, the system uses predict function. This function returns the name of the input face and displaying over it (Figure 4). It uses a confidence value which is obtained by comparing the histogram of the input face image with a histogram of the image from the data set. Ideally, this confidence value should be zero but due to real-time surroundings, it is not possible to attain this value. The system uses a threshold value instead the more the confidence value of the image is less then the more it is recognizable and if the value is greater than the threshold value then it returns unknown as the message and image cannot be recognized.

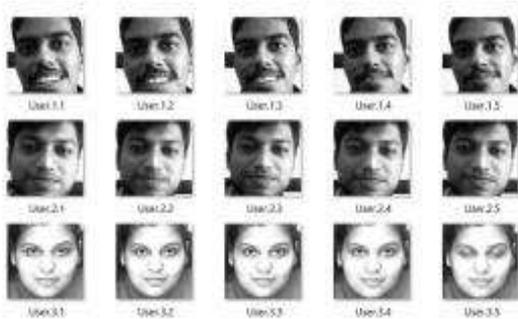


Figure 3: Data set to train LBP Classifier

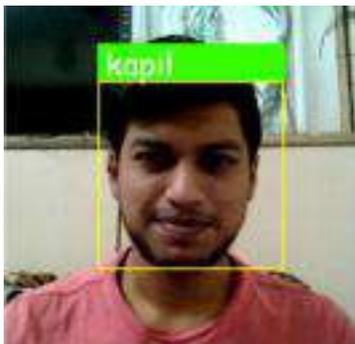


Figure 4: Face Recognition

VII. FUTURE SCOPE AND LIMITATIONS

In future, a few data analytic techniques are implemented to observe the behavior of the students over a given period of time. On the premises of various building complexes, this system can be implemented for security and surveillance. In the field of medical by taking into consideration of real-time emotion detection of the patient and patient tracking, this system can be implemented. In terms of limitations as the system could be associated with the private data of registered persons which can be vulnerable if it is not secured enough. Also, on large scale, the system requires a large amount of data which in terms of storage limits the system. The system can also be used in permission-based systems and secure access authentication (restricted facilities) for access management, home video surveillance systems for personal security or law enforcement .

VIII. CONCLUSION

It is concluded that a reliable, secure, fast, and efficient class attendance management system is developed replacing a manual and unreliable system. This face detection and recognition system saves time, reduces the amount of work done by the administration, and replaces the stationery material currently in use with already existent electronic equipment. There is no need for specialized hardware for installing the system as it only uses a computer and a camera. The camera plays a crucial role in the working of the system hence the image quality and performance of the camera in the real-time scenario must be tested especially if the system is operated from a live camera feed.

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X. AUTHORS PROFILE



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OPEN ACCESS INTERNATIONAL JOURNAL OF SCIENCE & ENGINEERING

AGRICULTURAL MULTI-PRODUCTION CONTROL AND MANAGEMENT SYSTEM

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Abstract - Agriculture sector is that the mainstay of the Indian economy development of agriculture will help in upliftment of the farmers but also benefit the larger section of the agricultural poor who are into the agriculture and indirectly linked with agriculture as consumers. Efficient way of production, stabilized prices, higher income from agriculture would create a more conjugative environment within the country for the development of the economy as a whole and of the rural population in particular. Vermicompost and Greenhouse are the 2 of the methods adopted mainly for the agricultural purpose by many of the farmers in India. The main purpose of our project is to make a sophisticated agricultural system with the assistance of IoT applications, in order that farmers can easily maintain their farm. We are going to create an automation system which might manage things on the farm without the assistance of any human hand. Moreover, it'll have the choices of measuring moisture, humidity, temperature, light intensity etc. The subsequent implementation procedure of Farm Automation with IoT application, watering, , 24-hour automatic monitoring, temperature measuring , collecting and sending data to the users, easy to operate. The main goal of this project is to form brand new agricultural revolution and help the small-scale farmer for better production.

Keywords— Vermicompost Plant, Greenhouse Plant, Arduino Ide, Mosquito Broker, Node red, MariaDB.

I INTRODUCTION

Vermicomposting System and Smart Greenhouse System. Proposed System is meant as a low-cost solution for Small-Scale Industries. India is an agricultural country endowed with plenty of fertile land having three cropping seasons. Almost 60% of our population was apparently involved in farming. As time passes by, we will now see a totally different scenario. Nowadays, in our country people are more tending towards centralized towns because farming isn't a simple task and farmers don't get enough income through farming. Recent statistics show us that the expansion rate of farmers in India has delayed over the last decade and caused the autumn in production growth. Here we've come up with an idea where farming can be considered as a simpler task. People can easily monitor the cultivation process from time to time even once they aren't available in the field. First of all, we must mention that countries just like the U.S China, and Japan are already devouring a lot of expenses and time to create farming, even though they don't have fertile land like India. Moreover, the research shows how briskly the employment of agricultural robots is growing per annum and

around 13% of the full industrial robot belongs to the agricultural sector. As we will see, countries that are developed are using automation systems for increased efficiency whereas developing countries like ours are way behind these automated systems. Therefore, we've become inspired to try to do such projects. Primarily we are working on Smart. Vermicomposting could be low-cost technology which is a natural process that transforms organic wastes into organic fertilizers, generally known as vermicomposting, through the collective action of earthworms and mesophilic microorganisms. Vital parameters like moisture and temperature must be considered within the vermicompost production to attain optimum yield. However, manual monitoring and modifications of those said parameters do not give guaranteed outcomes.

A greenhouse may be a framework that utilizes nursery transformation to create a positive ecological condition virtually to develop ideal creation of plants. Controlling climatic conditions is one amongst the most critical challenges in agricultural business. In like manner, an automated nursery framework has been developed to obtain

observations and control over the climatic parameters which is straightforwardly or during a detour that administers the plants development and generation.

II. MQTT PROTOCOL AND NODE RED PROTOCOL

A. MQTT Protocol

MQTT being a publish/subscribe protocol that enables fringe network devices to publish to a broker. Clients hook up with this broker, which then mediates communication between the 2 devices. Every device can Subscribe, or register on a subscribed topic, the broker sends the message to any client that has subscribed. MQTT is two directional and maintains stateful sessions awareness. If a grip of a network device loses connectivity all subscribed clients are notified with the “last will and testament” features of the MQTT server in order that any authorized client within the system can publish a brand-new value back to the sting of the network device maintaining bidirectional connectivity. The MQTT protocol has many advantages are Distribute information more efficiently, Increase scalability, Reduce network bandwidth consumption dramatically, Reduce update rates to seconds, Very well-suited for remote sensing and control, Maximize available bandwidth, Extremely lightweight overhead, Saves Development time, Publish /Subscribes collects more data with less bandwidth compared to polling protocols

B. Node-Red

Node-RED being a programming tool for wiring together hardware devices, APIs and online services in new and interesting ways. It provides a browser-based editor that produces easy wire flows using the wide array of nodes within the palette which is able to be deployed to its runtime during a single-click. Node-RED enables users to stitch together Web services and hardware by replacing common low-level coding tasks and this may be done through a visual drag-drop interface. Various components in Node-RED are connected together to form a flow. Most of the code needed is formed automatically. The major features of Node-RED are it supports browser-based flow editing, because it’s constructed on Node.js, it supports a light -weight runtime environment along with the event driven and non-blocking model. The numerous flows created in Node-RED are stored using JSON, which could be easily imported and exported for sharing with others. You’ll run it locally (Docker support, etc.). It can easily fit on most generally used devices like Raspberry Pi, Beagle Bone Black, Arduino, Android based devices, etc. It can run in cloud environments like Blue mix, AWS, MS-Azure, etc.

III. SQL DATABASE

SQL is the commonest language for extracting and organizing data that’s stored within the database. A database may be a table that consists of rows and columns. SQL is used for management of databases. It helps in fetching specific information from databases that can be used for analysis. Even when the analysis is being done on another platform like Python or R, SQL would be needed to extract the data that you just need from a company’s database. SQL manages an outsized amount of information, especially if there's a lot of data that’s being written simultaneously and there are too many data transactions. There are different versions and frameworks for SQL, the foremost commonly used is MySQL. MySQL is an open-source software that helps promote SQL’s role in managing back-end data for processing solutions. Companies like Facebook, Instagram, WhatsApp, etc. all use SQL for data storing and data processing solutions. When SQL query is written & run (or parsed), it is processed by a query optimizer. When the query attains SQL server, there it is compiled in three phases; Parsing, Binding and Optimization.

➤ Parsing – A process to check the syntax

➤ Binding – A process to check the query semantics

➤ Optimization – A process to get the query execution plan

In the third step, all possible permutations and combinations are generated to seek out the foremost effective query execution plan in a very reasonable time. The shorter time the query takes, the better it is. This programming language has various uses for data analysts & data science professionals. It is particularly helpful because it can:

➤ Execute queries against a database

➤ Retrieve data from a database

➤ Insert records into a database

➤ Update records during a database

➤ Delete records from a database

➤ Create new databases, or new tables in an exceedingly database

➤ Create stored procedures & views during a database

➤ Set permissions on tables, procedures, and views

IV. LITERATURE REVIEW

As part of our pre-study, we conducted an elaborate literature survey. The literature survey presents an outline on the Agricultural Multi Production Control and Management System. The journals were analyzed and content was presented. After analyzing what systems are published within the journals, we presented our ideas which were focused on setting a little small scale but effective agricultural multi production system for farmers. In many

processes human effort could be a key factor for inspection of every kind of module. In most of those processes vision systems offer possibilities for more efficiency, faster production and better control over product quality. Furthermore, vision systems enable improvement of processes that have already been automated. In sensor based automated agricultural systems explained about the automated technology of manufacturing an honest quality manure for crops additionally as growing crops. The sensors used are DS18B20, DHT11, Capacitive Soil Moisture Sensor and Esp32 devkit development board with a ESP32 microcontroller which receives the send input signals by gathering temperature, moisture, light intensity and humidity conditions. An ESP based control system in intelligent farming explains about the improvement of the assembly process in planting in addition to manure production which consists of two parts which are a sensor system and control system. Control system uses MQTT Protocol, SQL database, Node-Red, Web Socket. And therefore, the data is displayed on the user end. We use Open CV which may be a computer vision library used extensively within the industry. We use the Python programming language because it is straightforward to use and has sufficient speed for our task. Raspberry Pi 4 could be a low-cost single board computer which is powerful enough to try and do computer vision in real time. The system is beneficial for the farmers who work on small-scale. It will help them grow more efficiently as well as further earning more.

V. SYSTEM DESIGN AND IMPLEMENTATION

The system design is divided in two parts: Sensor System and Control System.

A. Sensor System

The implementation of hardware is done in two subsystems Vermicompost and Greenhouse. Both the systems consist of a Esp32 development board devkit the main computing device used to generate the data for comparison mechanism. The sorting mechanism will be implemented using a microcontroller. It will receive inputs from sensors for comparison with the threshold values. It drives the water pump, ventilation system, light mechanism according to data received from the sensors and it's also responsible for taking actions.

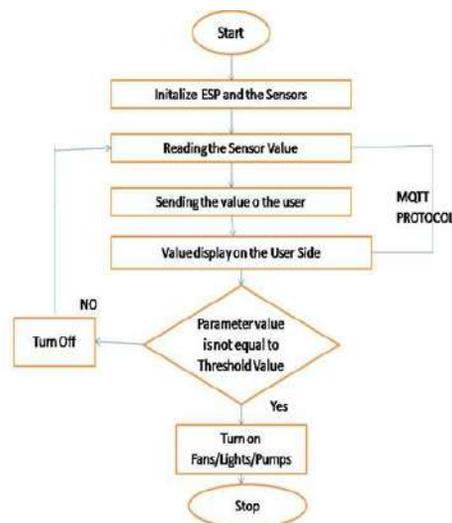


Fig 5.1

B. Control System

Control system uses MQTT Protocol, SQL database, Node-Red, Web Socket and also data is displayed on the user end. The MQTT protocol being a communication protocol is employed for the communication purpose between the Microcontrollers and therefore the Database. The node red application here publishes the data within the topic ESP32/OUTPUT. The ESP32 is subscribed to the topic. The ESP32 publishes temperature on the Esp32/temperature topic and humidity on the Esp32/humidity topic. The node red application is subscribed to those topics. So, it obtains humidity and temperature readings that may be displayed. The Web Socket protocol here is used for bidirectional communication between the server and also the clients using TCP connection i.e. The information is often sent from the client to the server and from server to the client at any given time.

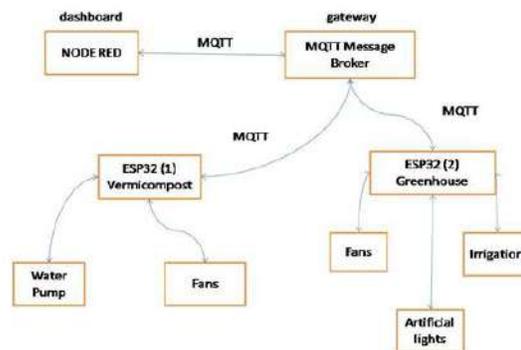


Fig 5.2

VI. RESULTS

The figures below show the implemented system outputs and graph of data collected on site at real time. Fig.4 shows

the outcomes of 24-hour monitoring obtained from the module. It shows Humidity, Light Intensity level, Pit temperature, Atmosphere temperature of both Systems. There's graphical representation for analysis and monitoring.

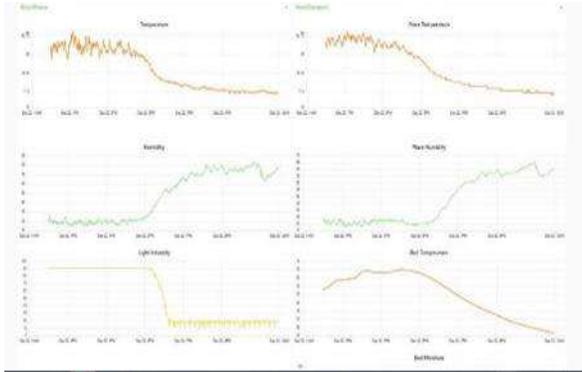


Fig 6.1

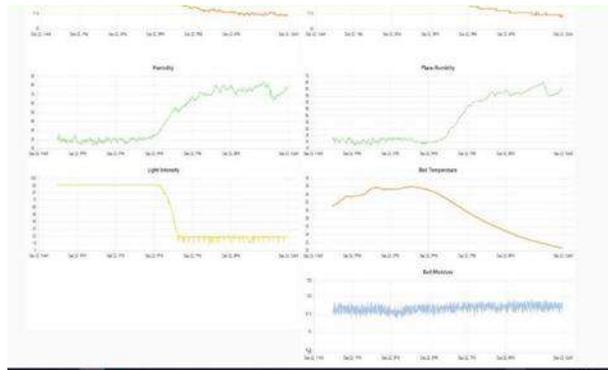


Fig 6.2

A. Console Output

Fig 7.3 & Fig 7.4 shows the code used for the connection established between the ESP32 and sensors with the outputs obtained for both the systems.

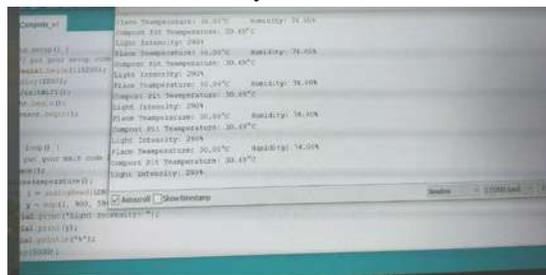


Fig 6.3

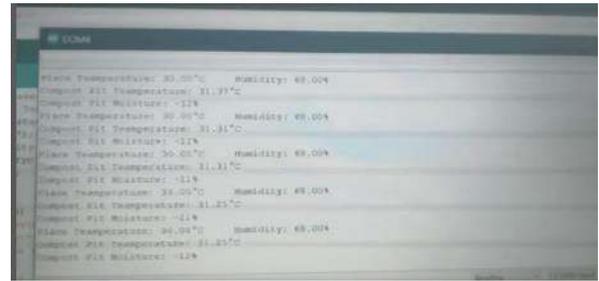


Fig 6.4

B. Onsite Monitoring



Fig 6.5



Fig 6.6

C. PCB Design

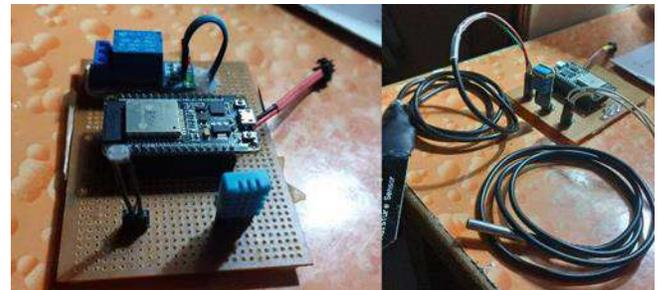


Fig 6.7

VII. CONCLUSION

The developed system is suitable for both large scale agribusiness likewise as small agriculture farms. For big scale agribusinesses, the price will be increased for conditioning equipment but controlling costs are going to be the identical all told arenas which are significantly less than labor costs. Moreover, the efficiency and accuracy of the systems is more detailed than manual systems. It eliminates the chance of human errors being eco-friendly.

VIII. Future Scope

Future work that can be implemented in this project is Cattle management, Poultry management, Surveillance and Irrigation etc. Further to enhance the operation of the system we can incorporate other wireless technologies such

as ZIGBEE, LORA etc. Such systems can be implemented in small scale industries for better production for commercial purposes. Farmers would be benefited with such implementation of project

IX ACKNOWLEDGMENT

The group members would like to thank the people who have read this paper and gave useful suggestions. Mainly Prof. Rajeshwari Malekar of MMCOE, Yash Dhage of Yash Farm's, Krishna Karegaonkar of Krishna Agro Groups.

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PLC BASED DAM GATE OPEN-CLOSED SYSTEM

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Abstract -Programmable Logic Controllers are at the forefront of manufacturing automation. Many factories use Programmable Logic Controllers to cut production costs and increase quality. Since its predecessor was hard-wired relay panels, the Programmable Logic Controller uses a unique language called ladder logic. Although other languages are used, ladder logic presently remains the dominant language of automation. The Programmable Logic Controller (PLC) is sometimes called a Programmable Controller (PC), but the abbreviation PLC is preferred to distinguish it from the Personal Computer.

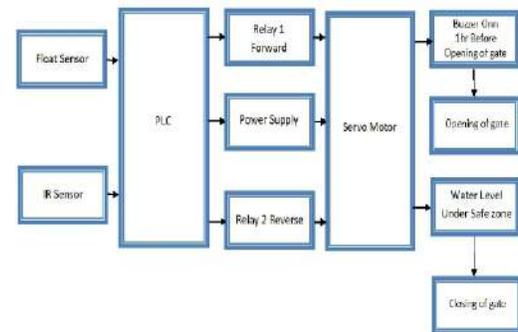
I INTRODUCTION

The successful implementation of a real-time model-based dam automation system is an important step toward developing a convenient and efficient water management strategy. For the purposes of this paper, 'PLC-based dam Gate open-close system' will refer to the process of changing the reservoir release gate to accommodate a change in downstream demand without human intervention. Recommended releases are calculated by the model every hour and are immediately applied to the dam release gate. Due to the complicated and time-consuming process in a manual system, a model for Remote Monitoring and Controlling of Dams is proposed that uses remote control technology, linked to OPC-UA technology, to attain great success in monitoring and controlling water levels in managing dams. Controlling water supply is not only complex to manually control a dam, but also time-consuming and excessively risky in times of bad weather.

II. LITERATURE SURVEY

As per the current situation, we usually face the problem of dams for the opening and closure of its gates at the time of high water levels and also there are very less dams with the feature of pre indication of this process for the nearby villages and towns. So our project merely focuses on the process of opening and closing the dam gates as per the flow of water in the reservoir and also provides the pre indication/warning before the opening and closing process. Basically, our project works with PLC to manage this situation and the problems faced by many dams having traditional methods of application of such processes and helps to find easy and effective workflow.

III. BLOCK DIAGRAM



VI. HARDWARE DESIGN AND DESCRIPTION

1. Programmable Logic Controller.

Inputs to, and outputs from, a PLC are necessary to monitor and control a process. Both inputs and outputs can be categorized into two basic types: logical or continuous. Consider the example of a light bulb. If it can only be turned on or off, it is logical control. If the light can be dimmed to different levels, it is continuous. Continuous values seem more intuitive, but logical values are preferred because they allow more certainty, and simplify control. As a result most controls applications (and PLC's) use logical inputs and outputs for most applications. Outputs to actuators allow a PLC to cause something to happen in a process. A short list of popular actuators is given below in order of relative popularity. Solenoid Valves—logical outputs that can switch a hydraulic or pneumatic flow. Motor Starters—motors often draw a large amount of current when started, so they require motor starters, which are basically large relays. Servo Motors—a continuous output from the PLC can command a variable speed or position. Outputs from PLC's are often relays, but they can also be solid state electronics such as

transistors for DC outputs or Triacs for AC outputs. Continuous outputs require special output cards with digital to analog converters, or can be used another module for PLC analogue o/p. Inputs come from sensors that translate physical phenomena into electrical signals. Typical examples of sensors are listed below in relative order of popularity. Proximity Switches—use inductance, capacitance or light to detect an object logically. Switches—mechanical mechanisms will open or close electrical contacts for a logical signal. Potentiometer—measures angular positions continuously, using resistance. LVDT (linear variable differential transformer)—measures linear displacement continuously using magnetic coupling. Photoelectric sensor use the ultrasonic signal to detect any interruption within limited range. Inputs for a PLC come in a few basic varieties; the simplest are AC and DC inputs. Sourcing and sinking inputs are also popular. This output method dictates that a device does not supply any power. Instead, the device only switches current on or off, like a simple switch. PLC inputs must convert a variety of logic levels to the 5VDC logic levels used on the data bus. Basically the circuits condition the input to drive an opto coupler. This electrically isolates the external electrical circuitry from the internal circuitry. Other circuit components are used to guard against excess or reversed voltage polarity. PLC outputs must convert the 5VDC logic levels on the PLC data bus to external voltage levels. Basically, the circuits use an opto coupler to switch external circuitry. This electrically isolates the external electrical circuitry from the internal circuitry. Other circuits components are used to guard against excess or reversed voltage polarity.

2. Light Emitting Diode

A light-emitting diode (LED) is a semiconductor light source that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons. The color of the light (corresponding to the energy of the photons) is determined by the energy required for electrons to cross the band gap of the semiconductor. White light is obtained by using multiple semiconductors or a layer of light-emitting phosphor on the semiconductor device. Appearing as practical electronic components in 1962, the earliest LEDs emitted low-intensity infrared (IR) light. Infrared LEDs are used in remote-control circuits, such as those used with a wide variety of consumer electronics. The first visible-light LEDs were of low intensity and limited to red. Early LEDs were often used as indicator lamps, replacing small incandescent bulbs, and in seven-segment displays. Recent developments have produced LEDs available in visible, ultraviolet (UV), and infrared wavelengths, with high, low, or intermediate light output, for instance white LEDs suitable for room and outdoor area lighting. LEDs have also given rise to new types of displays

and sensors, while their high switching rates are useful in advanced communications technology with applications as diverse as aviation lighting, fairy lights, automotive headlamps, advertising, general lighting, traffic signals, camera flashes, lighted wallpaper, horticultural grow lights, and medical devices.

3. IR Sensor

IR technology is used in daily life and also in industries for different purposes. For example, TVs use an IR sensor to understand the signals which are transmitted from a remote control. The main benefits of IR sensors are low power usage, their simple design & their convenient features. IR signals are not noticeable by the human eye. The IR radiation in the electromagnetic spectrum can be found in the regions of the visible & microwave. Usually, the wavelengths of these waves range from 0.7 μm to 1000 μm . The IR spectrum can be divided into three regions like near-infrared, mid, and far-infrared. The near IR region's wavelength ranges from 0.75 – 3 μm , the mid-infrared region's wavelength ranges from 3 to 6 μm & the far IR region's infrared radiation's wavelength is higher than 6 μm .

4. Human Machine Interface

A Human-Machine Interface (HMI) is a user interface or dashboard that connects a person to a machine, system, or device. While the term can technically be applied to any screen that allows a user to interact with a device, HMI is most commonly used in the context of an industrial process. Although HMI is the most common term for this technology, it is sometimes referred to as Man-Machine Interface (MMI), Operator Interface Terminal (OIT), Local Operator Interface (LOI), or Operator Terminal (OT). HMI and Graphical User Interface (GUI) are similar but not synonymous: GUIs are often leveraged within HMIs for visualization capabilities. In industrial settings, HMIs can be used to: Visually display data, Track production time, trends, and tags Oversee KPIs, Monitor machine inputs and outputs And more similar to how you would interact with your air-conditioning system to check and control the temperature in your house, a plant-floor operator might use an HMI to check and control the temperature of an industrial water tank, or to see if a certain pump in the facility is currently running. HMIs come in a variety of forms, from built-in screens on machines, to computer monitors, to tablets, but regardless of their format or which term you use to refer to them, their purpose is to provide insight into mechanical performance and progress.

5. Servo Motor

A servomotor (or servo motor) is a simple electric motor, controlled with the help of servomechanism. If the motor as a controlled device, associated with servomechanism is DC motor, then it is commonly known as a DC Servo Motor. If AC operates the controlled motor, it is known as a AC Servo Motor. A servomotor is a linear actuator or rotary actuator

that allows for precise control of linear or angular position, acceleration, and velocity. It consists of a motor coupled to a sensor for position feedback. It also requires a relatively sophisticated controller, often a dedicated module designed specifically for use with servomotors. There are some special types of applications of an electric motor where the rotation of the motor is required for just a certain angle. For these applications, we require some special types of motor with some special arrangement which makes the motor rotate a certain angle for a given electrical input (signal). For this purpose, servo motor comes into the picture. The servo motor is usually a simple DC motor controlled for specific angular rotation with the help of additional servomechanism (a typical closed-loop feedback control system). Nowadays, servo systems are used widely in industrial applications.

6. Buzzer

An audio signaling device like a beeper or buzzer may be electromechanical or piezoelectric or mechanical type. The main function of this is to convert the signal from audio to sound. Generally, it is powered through DC voltage and used in timers, alarm devices, printers, alarms, computers, etc. Based on the various designs, it can generate different sounds like alarm, music, bell & siren. The pin configuration of the buzzer is shown below. It includes two pins namely positive and negative. The positive terminal of this is represented with the '+' symbol or a longer terminal. This terminal is powered through 6Volts whereas the negative terminal is represented with the '-' symbol or short terminal and it is connected to the GND terminal. The applications of the buzzer include the following. Communication Devices Electronics used in Automobiles Alarm Circuits, Portable Devices Security Systems Timers, Household Appliances Electronic Metronomes Sporting Events Annunciator Panels Game Shows.

7. Software Design

Automation Studio 4. A single uniform programming tool for every aspect of an automation project minimizes training needs, solidifies overall integration, and eliminates communication problems between engineering disciplines. Cut development costs Save time and money by starting software development before the hardware is completed, reusing software modules across multiple projects, validating functionality via simulation and carrying out commissioning module by module.

8. Integrated visualization

The visualization system integrated in Automation Studio is an effective tool that can be used to create line displays as well as control integrated or remote XGA displays with keys and/or touch screens. This integration eliminates the need for external visualization tools, introducing cost savings for integrated machine visualization. Remote services such as

VNC allow immediate remote operation and maintenance without additional expense.

9. Diagnostics

Automation Studio provides a wide selection of diagnostic tools for reading system information and for optimizing the system. Using the System Diagnostics Manager, extensive information about the target system can be read using standard Web access.

10. Remote maintenance

From process management to firmware exchange and everything in between Machines and systems are often operated in remote locations. As a result, service and maintenance tasks are generally dominated by travel expenses. Remote diagnostics and remote maintenance lower the risk, particularly during warranty periods. Whether performing hardware diagnostics, setting values or utilizing assisted machine operation, the integration of VNC, a Web server and remote programming provides valuable services for all phases of a machine's life cycle.

VIII. IMPLEMENTATION

1. Open Platform Communication Unified Architecture

The OPC Unified Architecture (UA), released in 2008, is a platform independent service-oriented architecture that integrates all the functionality of the individual OPC Classic specifications into one extensible framework. This multi-layered approach accomplishes the original design specification goals of: Functional equivalence all COM OPC Classic specifications are mapped to UA, Platform independence: from an embedded micro-controller to cloud-based infrastructure, Secure: encryption, authentication, and auditing, Extensible: ability to add new features without affecting existing applications, Comprehensive information modeling: for defining complex information, Functional Equivalence, Building on the success of OPC Classic, OPC UA was designed to enhance and surpass the capabilities of the OPC Classic specifications. OPC UA is functionally equivalent to OPC Classic, yet capable of much more. Discovery: find the availability of OPC Servers on local PCs and/or networks. Address space: all data is represented hierarchically (e.g. files and folders) allowing for simple and complex structures to be discovered and utilized by OPC Clients, On-demand: read and write data /information based on access-permissions, Subscriptions: monitor data/information and report-by-exception when values change based on a client's criteria, Events: notify important information based on client's criteria Methods: clients can execute programs, etc. based on methods defined on the server Integration between OPC UA products and OPC Classic

products is easily accomplished with COM/Proxy wrappers that are available in the download section.

IX. HARDWARE PLATFORMS

Traditional PC hardware, cloud-based servers, PLCs, micro-controllers (ARM etc.).

X. OPERATING SYSTEMS

Microsoft Windows, Apple OSX, Android, or any distribution of Linux, etc. OPC UA provides the necessary infrastructure for interoperability across the enterprise, from machine-to-machine, machine-to-enterprise and everything in-between. Transport numerous protocols are defined providing options such as the ultra-fast OPC-binary transport or the more universally compatible JSON over Websockets, for example Session Encryption: messages are transmitted securely at various encryption levels, Message Signing: with message signing the recipient can verify the origin and integrity of received messages. Sequenced Packets: exposure to message replay attacks is eliminated with sequencing. Authentication: each UA client and server is identified through X509 certificates providing control over which applications and systems are permitted to connect with each other. User Control: applications can require users to authenticate (login credentials, certificate, web token etc.) and can further restrict and enhance their capabilities with access rights and address-space “views”. Auditing: activities by user and/or system are logged providing an access audit trail

Extensible

The multi-layered architecture of OPC UA provides a “future proof” framework. Innovative technologies and methodologies such as new transport protocols, security algorithms, encoding standards, or application-services can be incorporated into OPC UA while maintaining backwards compatibility for existing products. UA products built today will work with the products of tomorrow.

XI. FUTURE WORK

Since wired technology is used in our proposed system there is scope to further modify it by using wireless RF technology. Thus the communication between the controller and the driving element can be established wirelessly. Improvements can be made with minor changes in this model by eliminating the operator and providing the complete control to microcontroller (automatic level control). It can be used for level monitoring and control in industries. Control of irrigation dam and other large dams used for power generation and water supply should be different; as control of both types together will be very complex since there are total 5200 dams (approx.) in India. Therefore a major future work can be possible in which a

centralized control of all the dams in a state using GPRS or other wireless technology under central government can be beneficial to the whole country.

XII. CONCLUSIONS

In this project, it shows that motors are automatically controlled with the help of sensors and PLC. This model is helpful for the controlling of gates of dam. It is completely automatic by using the controlling of gates with PLC and feedback from the level sensors. So According to the water level, the gates of dam operate. This method is very effective for the saving of water. When the level of water increases it opens the gates and with the decrease of water level, it compares its position and performs accordingly i.e., opening and closing of gates of the dam. Thus, the use of PLC has opened doors for the automation of several fields effectively. There are various advantages of this model like as water supply in villages, industrial applications, household applications. Main advantage of this model is to control the gates in emergency situations. It records the data of water level so that the forecasting of the dam controlling can be done according to the time, month, season.

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ALCOHOL DETECTION WITH MOTOR LOCKING USING ARDUINO

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Abstract:- It is common to pick up the newspaper and read the news about an accidents occurs due to harsh driving By the drunk people. As per the latest report by the ministry of road transport and Highways, there have been 12,256 accidents in 2019 and 8,355 accidents in 2020 cases of drunk and driving was registered.

Alcohol is a thing which reduces the functioning ability of the drunk person. It will affect the function of brain, impairing thinking, reasoning and coordination of the body. To drive a vehicle safely all these abilities are essential. That's why effective and efficient solution for this problem has become a necessity. Our project is specially designed to reduce the number of road accident occurs due to drunk driving. In this project, we try to figure out the drunk and driving issue which causes huge problems like loss of public as well as private property. The Arduinouno board is integrated with alcohol sensor(MQ-3), buzzer and LED where alcohol sensor detects the concentration of alcohol in body by continuously analyzing his/her breathe. Once the alcohol detected the buzzer start buzzing and LED turns ON. Along with this, the speed of the vehicle reduces gradually and engine of the vehicle will stop.

Keywords-MQ-3 sensor ,Arduino UNO, Relay module, Engine locking, alcohol detection

1. INTRODUCTION

The data revealed by the ministry of road transport and highways highlights cases that shows that drunk and driving is that the main reason of inflicting road accident. Driving beneath the influence of alcohol is extremely abundant most popular in today's life. Doing thus means that individuals assume they are doing terribly grate work and alternative can impress by them. This issue is extremely common in youth generation. However they are not aware that by doing thus, they're endangering their own and alternative peoples life. The amount of accidents because of drunk driving has inflated tons recently. The enormity of the harmful trans there scends limits. The Indian Ministry of statics reported 7% of the total road accidents are happened simply because of drunk driving. there have been 12,256 accidents in 2019 and 8,355 accidents in 2020 cases of drunk and driving was registered, while people were left injured on the road after drink and driving accident. Bharat sets a legal limit of alcohol level of 30mg/100ml blood alcohol concentration(BAC) . The alcohol level beyond this limit will be restricted. For BAC level form 0.3-0.8, drivers feel confused and It will affect the function of brain, impairing thinking, reasoning and coordination of the body .At this stagedriver is unable to drive a car properly. So, there is a need of such system which detect this level and give alert.

The state government has taken several steps to curb drink and driving. Many kinds of strict laws have been made to stop drink and driving. It is not possible for the policemen and road safety officers to check every vehicle .They have some restriction due to space and time. There is that's why the need for the effective system which will detect the presence of alcohol which has no restriction like time and space.

2. LITERATURE REVIEW-

A. The author come forward with the idea of using GSM and GPS to check the ethanol present in alcohol. This technique is a little bit high price, but it really worth its value as it work one of a kind type of capabilities.

B. To save you inebriated driving creator have used PIC16F877A microcontroller however this microcontroller is also very pricey and outdated model. Nowadays unique kind of new microcontrollers are introduced in market and they are price range friendly as well. So instead of this microcontroller we can use arduinouno microcontroller which is superior and less expensive in fee.

C. To conquer this problem author recommend to this solve this hassle using MQ-2 alcohol sensor. However it will feel alcohol along with the gasoline flames which will leads to fake alarm at the same time as we are able to use MQ-3 sensor that is quit authentic.

D. To cope with alcohol and helmet detection at a time author endorse a device that is designed by using P89V57RD2

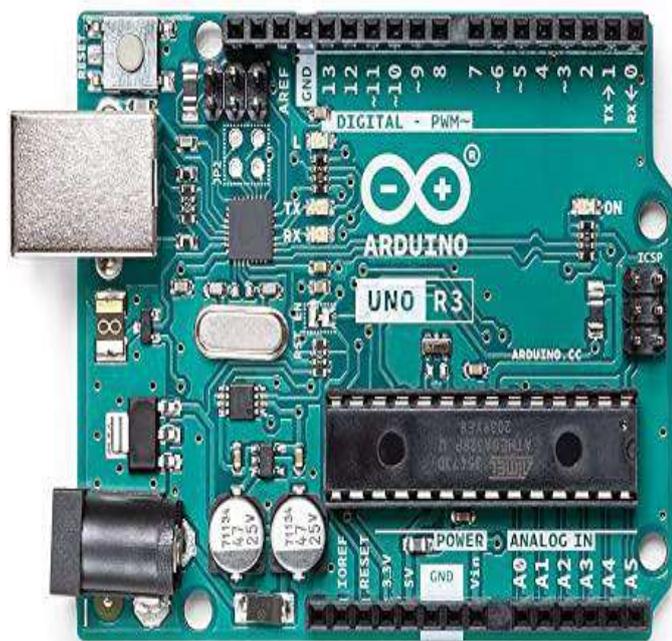


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microcontoller which is very luxurious and this system is useful for simplest bike users. The proposed device could be very complicated and it'll take lots of time with less outcomes .So,whereas we will use Arduinouno which is straightforward to application and economical.

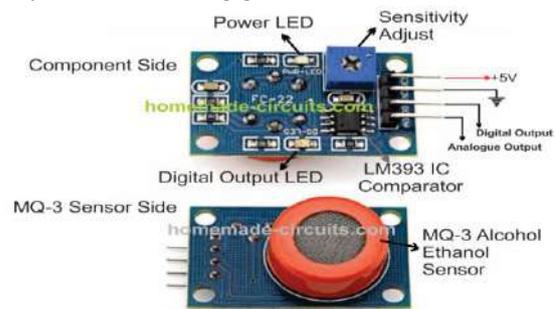
3. PROPOESD METHODOLOGY

The proposed work consist of Arduino UNO,MQ-3 sensor ,LED,Buzzer,DC motor, single channel relay module. The Arduinouno is open-source single Board .The Arduino Uno board A000066 R3 is ATmega328 based microcontroller which has 14 digital input and output and 6 analog inputs.It has a 16 MHz crystaloscillator, one USB connection ,power jack and a reset button. The arduino plays one-of-a- kindtype of functions like Microcontroller region unit, computer circuit unit and little computer system that is used to run different easy software program package applications.Arduinouno is widely used in distinctive areas. Arduino is mostly used by the begineers to design electronic projects and do programming with a c/c++.Arduinio boards are capable to read inputs-light on a sensor , objects located on a button, or a message and flip all given inputs into an output.



3.1.MQ-3 Sensor

The MQ-3 sensoris used as a alcohol gasoline sensor that could locate the presence of alcohol inside the surrounding. The maximum crucial material used for this sensor is SnO₂which is very sensitive material.In clean air the conductivity ofSnO₂ is much less . The MQ-3 sensor is a heater-driven sensor that 's enclosed in anti-explosion community.The MQ-3 sensor is used to determine the availability of alcohol stage in the surrounding and send all this statistics to Arduino which specifies whether the alcohol consumption level is limites or beyond the level. The MQ-3 alcohol sensor works on 5v DC and it is able to detect alcohol concentration from 25 to 500 ppm from anywhere.It is analog gas sensor.



3.2.RELAY MODULE

The single channel relay module may be a convenient board that is employed to keep up high voltage and current load for instance motor, fans and other household devices. The relay is associate degree magnetic forceswitch that operated employing a comparatively tiny current and manage a lot of larger current. The status LED can activate once the relay is activated and also the power LED will turn ON when the module is powered. Relay module has a three pins VCC,GND and In input where VCC pin is connected to 5v on the Arduino ,GND pin is connected to ground and IN Input pin is connected to digital pin for dominant the relay.

RELAY MODULE SPECIFICATION:

Rated though - current	Contro l Signal	Max. switching Voltage	Max. switchin g Current	Size
10A (NO) 5A(NC)	TTL level	250VAC/30VDC	10A	43mm*17mm*17mm



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3.3.BUZZER

A buzzer is a digital output component with two terminals. A Buzzer is employed to provide audio signals once voltage is applied which can generate beeps. The buzzer is additionally called as piezo buzzer that we are able to directly use with arduino. During this project buzzer is employed to indicate the presence of alcohol in surrounding. Piezo buzzer are made up of piezo crystals between two conductors. It will turn out sound within the vary of 2 to 4KHz.



3.6.LED

LED is a digital output component with two terminals anode and cathode. LED is additionally called as light emitting diode. LED produce light as electric current transfer through a semiconducting material, a diode which produce photons (means light) using electroluminescence Principle. Because the presence of alcohol is detected by the system LED can activate. Gallium arsenide (GaAs) and gallium phosphide (GaP) are the material that is employed usually within the production of LEDs.



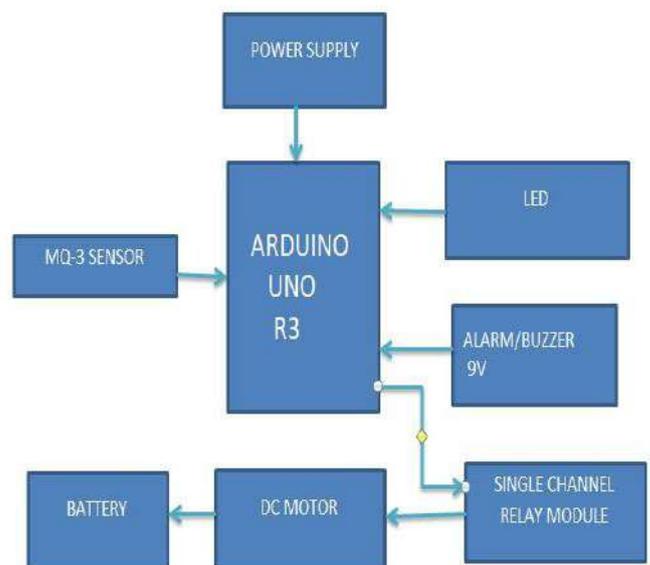
3.7.DC Motor

IMPACT FACTOR 5.856

To convert electrical energy to mechanical energy DC Motors are used. Lorentz Law principle is used to operate Dc motor functioning. The DC Motor is attached to the relay module and IN input pin of relay module is connected to the digital pin of arduino. It is a type of direct current motor that's ordinarily used.



4.WORKING-



To implement this project we use 4 digital and 1 analog pins. We have used LED and buzzer to indicate the alert alarm. LED's positive terminal is connected to the digital pin number 13 and negative is connected to the ground. Buzzers anode is connected to the digital pin number 8 and cathode is connected to the ground. Digital pin number 9 is connected to



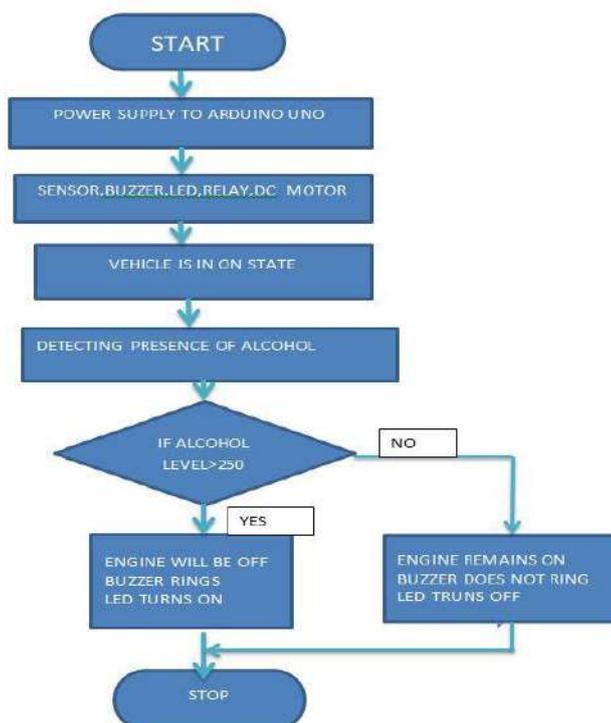
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the IN input pin of the relay module and so on. Using arduinouno system, the entire system is design to monitor the drivers breath continuously. The sensor is placed near the driver from where detection of alcohol will be easy. Then MQ-3 sensor measure the alcohol concentration and send the stored information /readings to the Arduino board. After receiving the input arduino compare recorded threshold value and set threshold value .That’s why , if alcoholic person try to drive a vehicle then the engine of the vehicle will locked automatically. We used Dc motor to demonstrate working engine of vehicle to show how it will locked once alcohol is detected in surrounding.

When alcoholic driver drink during driving then the sensor will sense the presence of alcohol. If the traces of alcohol present in the air is more than fixed threshold value then buzzer starts buzzinging ,LED turns ON and engine of the vehicle will locked automatically by reducing speed of the vehicle.If Alcohol is not detected in the system the buzzinging will stop , LED turns OFF and engine of the vehicle will start. The entire working of the system is explained in the form of flow ,in which it will represent the operation of the whole system.

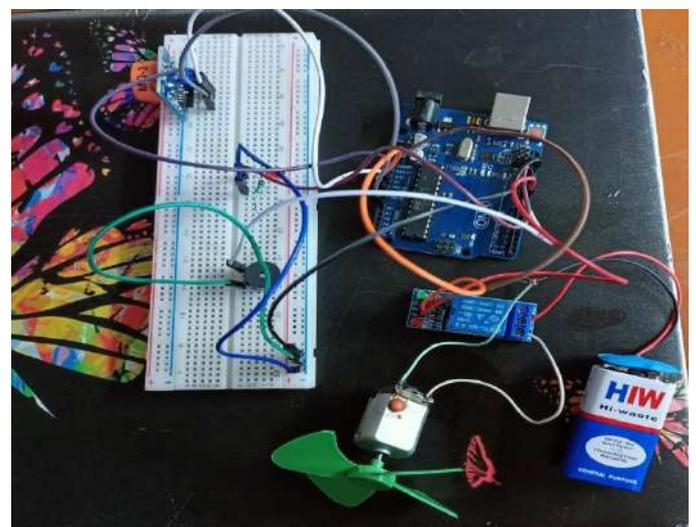
The Flow-chart is as given below:

FLOW CHART-

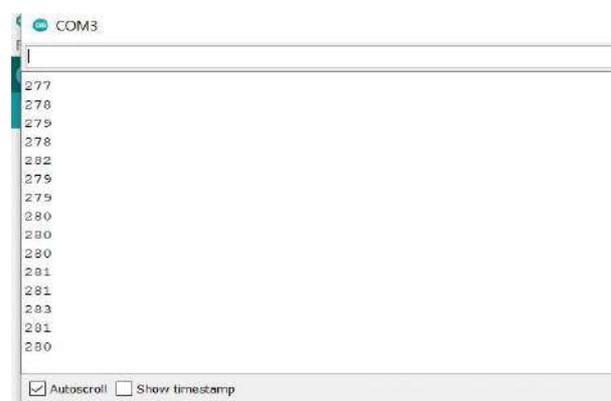


5.RESULTS AND DISCUSSION-

As we mention ,using arduinouno this proposed system monitors the drivers breath continuously .The output of this project is displayed using different components like LED ,buzzer and Dc motor. The hardware connections of the entire system are as given below.



The recorded value of alcohol concentration can be observed on the serial monitor inArduino(IDE) as shown below-



Output on serial monitor when alcohol is consumed

6.CONCLUSION

This is a effective and efficient system as it will detect the presense of alcohol in the air . If any traces of alcohol detect in system beyond the fix threshold value ,the buzzer starts buzzinging and automatically engine is locked by reducing the speed of the engine .As it will monitor drivers breath continuously ,so there will be no chance of drunk driving at



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any condition. According to our requirements and needs sensors and the other components can be configured .All the components used in the designing of the project are accurate, portable and specifically design to perform dedicated task. That's why we get our desired output and implementation is also done with good result.

7.FUTURE SCOPE

In future we can implement this system along with AI face recognition system . It will used in companies. To check there employee whether they consumed alcohol or not during there working hours. The project could be improved by adding GPS and GSM module in it. If the alcoholic person is drunk beyond the fix threshold value then by using GPS module ,the location of the vehicle is directly shared with the nearby. Traffic police department officers to take a strict action .GSM module can be interfaced to alert person/family members by sending them a message else police can used it to send the message or E-mail to the alcoholic person regarding challan.

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FACE MASK DETECTION

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Abstract -Currently Corona virus disease from 2019 has affected the planet seriously, which has continued to be the explanation for plight for countless lives and businesses even in 2022 because the world trying to get better from the pandemic situation and plans to return to the state of normalcy, there's a wave of tension among all individuals, especially those that will resume face to face activity. Studies has proved that wearing a mask significantly reduces the danger of viral transmission still as provides a way of protection. However, it's not possible to personally go there and track the implementation of this policy. We have introduced Deep Learning based system that may detect instances where face masks aren't used properly. The system has a dual stage Convolution Neural Network (CNN) architecture, detecting people with mask and without mask and capable to integrated with pre-installed CCTV cameras. This may help track safety violations, promote the utilization of face masks, and ensure a secure working environment.

Keywords: Convolution Neural Networks (CNN), Face Detection, Face Tracking, COVID-19.

I INTRODUCTION

The technique of detecting and recognizing the objects using deep learning is especially won't to generate captions. COVID-19 has become a world pandemic with an exponential rate of growth and an incompletely understood transmission process. A Mask play an important role during this situation as, to outbreak the chain of covid-19. during this approach of detecting in covid-19, a mask image is given as an input then the relevant output is being provided. a completely unique approach to detect mask using Image processing and Machine Learning.

Face-mask detection

A novel approach to detect masked face using Image captioning and Machine Learning. The technique of detecting and recognizing the objects using deep learning is especially accustomed generate captions. Propose two-stage CNN architecture, where the primary stage detects human faces, while the second stage uses a light-weight image classifier to classify the faces detected within the first stage as either Mask or No Mask faces and draws bounding boxes around them together with the detected class name. This algorithm was further extended to videos moreover. The detected faces are then tracked between frames using an object tracking algorithm, which makes the detections robust to the noise because of motion blur. this method can then be integrated with a picture or video capturing device sort of a CCTV camera, to trace safety violations, promote the

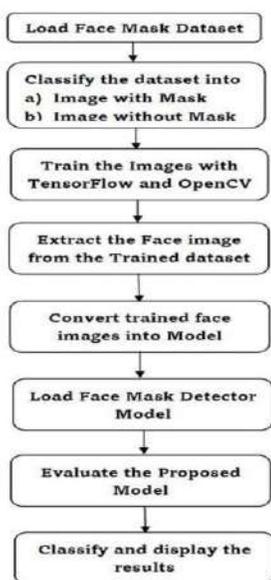
employment of face masks, and ensure a secure working environment.

II. LITERATURE REVIEW

Deep cascaded multi-task framework which exploits the inherent link between them to spice up their performance. Introduce a multi-task CNNs based framework for joint face detection and alignment. A deep cascaded multi-task framework which use the inherent link between them to spice up their performance.[1]A model capable of generating novel descriptions from images. during this work, they're using CNN also as RNN. Pre-trained Convolutional Neural Network (CNN) is employed for the image classification task. This network acts as a picture encoderto guage various face detection and recognition methods, provide complete way for image-based face detection and recognition with higher accuracy. [2] Two-stage architecture for detection of masked and unmasked faces and localizing them because the pandemic slowly settles and such sectors become desirous to resume in-person work, individuals are still skeptical of getting back to the office. 65% of employees are now worried about returning to the office (Woods, 2020). Multiple studies have shown that the utilization of face masks reduces the chance of viral transmission furthermore as provides a way of protection (Howard et al., 2020; Verma et al., 2020). However, it's infeasible to manually enforce such a policy on large premises and track any violations. Computer Vision

provides a much better alternative to the present. employing a combination of image classification, object detection, object tracking, and video analysis, They developed a sturdy system which will detect the presence and absence of face masks in images still as videos.[4] The mask detection system is presented to detect a sort of mask and masks of various shapes from the video streams for following the foundations that applied. Deep Learning algorithm and PyTorch Library is employed for detection from the images/video streams. The proposed system is developed to detect people with masks or without masks. The MobileNETV2 classifier training process is employed because the first phase of the model done by using the PyTorch framework of deep learning and implementation formed with the OPENCV of python [8]. The Multi-Task Cascaded Convolutional Neural Network (MTCNN) approach is employed for the occluded faced detection problem. The embedded model within the Google FaceNet is performed by the countenance extraction. CNN is successively applied for detection and recognition problems. The Support Vector Machine (SVM) classification task has been characterized [9]. The FaceNet trained model tested on the datasets to indicate the higher face recognition rates. Receiver Operating Characteristics curve could be a visualization technique is employed to displays the definite presentation of a classification model. FaceNet model could be a baseline for a deep network and included with 22 deep convolutional network layers. This model is that the characteristics of identification, face recognition, verification, detection of images, prediction of real images and clustering of neural networks [10].

Flowchart: -



III. EXISTING METHOD

The world is now facing unprecedented pandemic like this because COVID 19 has high spreading and reproductive rates than the other germ which caused pandemic before. Until people find an efficient vaccine, the sole thanks to curb the spread of corona virus by wearing the mask. However, the method of observing and identifying the massive number of groups people is hard. the present technology is on the market for detecting the mask but our idea differs from the present method is that the smart devices are going to be inserted within the door and if the person is wearing a mask then door will open and if not then it won't.

IV. PROPOSE METHOD

The proposed system detects whether a personal is wearing of a mask and follows the protection measures. If that detects an individual with mask the door will open and shut. Convolutional layers take the three-dimensional input matrix we mentioned before and that they pass a filter (also called convolutional kernel) considered within the image, it formed to making during a small window of pixels at a time (i.e. 3x3 pixels) and this window until the full image has been scanned. CNNs accommodates the subsequent sequential. modules (each one may contain over one layer) refer Fig.3

- 1.Convolution
- 2.Relu
- 3.Pooling
4. Fully connected layers
5. Output layer

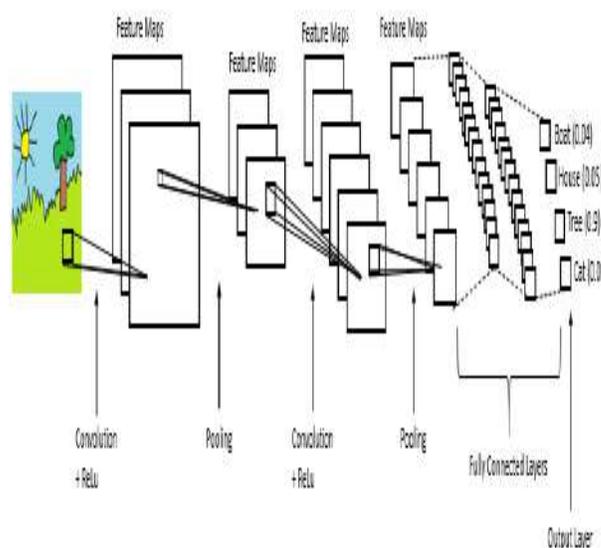


Fig.1 CNN architecture



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Fig.2 Dataset



Web development



Fig.3: Web Page

Interfacing of web with backend and adding some instructions to spread awareness was the aim. So, in “Home” page we've added information about the project and it's architecture diagram. In web content of 'About covid-19' we've added information about covid-19 about it's symptoms, precautions and treatment instructions. For this we've used html and css.

V. Results

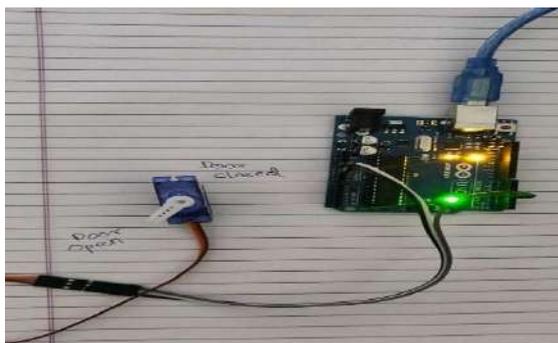


Fig.4: Results – With Mask

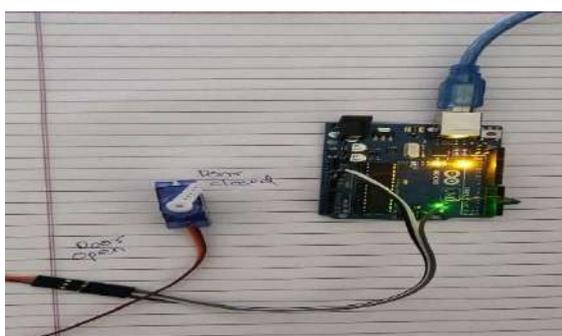
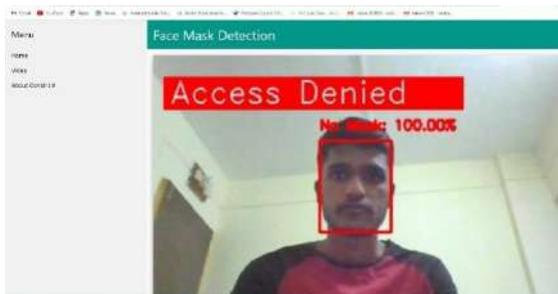


Fig.5: Results – Without Mask

VI. Future Scope

1. Model used to identify two or more masked faces.
2. Web application to upload people faces images from user.
3. Multiple cameras system installed at various places for detection of people not

wearing mask over a certain area. It will alert the security.

4. Identify the temperature of person.

VII. Conclusion

The proposed system to classify mask detection using COVID-19 precaution in detection of mask using convolution neural network. The work is intended to supply a security system for the people so as to avoid COVID-19. From the results we could observe that, the results obtained are simpler and affordable then conventional approach.

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SMART HELMET USING ARDUINO

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Abstract - The Smart Helmet is a protection used by bike rider that will give him greater security than ever before. The main purpose of this helmet is to provide safety for the bike rider. It will be used using advanced features such as alcohol detection, location detection, and fall detection. This makes not only a smart helmet but also a smart bike feature. It is compulsory to wear a protective helmet, otherwise the bike will not start. Here the RF Module can be used as a wireless communication link between sender and receiver. If the rider is drunk bike will not start. In the event of an accident, it will send a message via GSM module and location with the help of GPS module. A unique project tool to detect falls; when a passenger falls off a bike it sends a message to registered mobile number.

I INTRODUCTION

In more recent times wearing helmets while riding a bike has been enforced in Telangana Province. Road accidents in India are increasing every year. According to Section 129 of the Traffic Act, 1988, every person on two wheels is required to wear a protective helmet in accordance with BIS (Bureau of Indian Standards) standards. Also, drunk driving (DUI) is a criminal offense according to the Motor Vehicle act 1939, which states that a rider will receive a fine. Currently, rider are easily escaping from the law. So these are three key factors that motivate us to develop this work. The first step is to determine if the passenger is wearing a helmet or not. If a protective helmet is worn then the ignition of bike will begin otherwise it will always be closed. The second step is the discovery of alcohol. The alcohol sensor is used as a respirator that detects the presence of alcohol in the passenger air and if it exceeds the allowable ignition limit it cannot start. The MQ-3 sensor is used for this purpose. Only when these conditions are satisfactory will only the bike start. The third major problem is risk and medical help is delayed. If an accident occurs, he may not get immediate medical attention, which is one of the leading causes of death. Every second person dies as a result of medical delays, or in the event of an emergency. In the fall, we set the accelerometer on the bike unit. In this way, risks can be identified.

II. OBJECTIVE OF THE PROJECT

The project aims to create a helmet protection system for the safety of bike rider. The smart helmet is made with

different sensors responsible for the detection of various parameters. There are two key components of this project such as Bike unit and Helmet unit. Each unit uses an Arduino pro mini. The signal transmission between the helmet unit and the bike unit is performed using RF module.

III. TECHNICAL STUDIES

Arduino Pro mini — Arduino is an open source platform used to build power projects. It contains both a hardware cycle and a software tool, and this software is used to write code and upload it to arduino. Arduino IDE uses a simplified version of C ++, but this is one of the easiest ways to write code. Arduino can work with sensors, engines, internet, smart-phone, and TV. Arduino has a variety of boards but we have used pro mini here to build a circuit size as small as possible.



- 1) MQ-3 Alcohol Sensor—The MQ-3 gas sensor shown in Figure is used to identify the alcohol content of the breath. It will be placed in front of mouth. The sensor responds to various molecules in alcohol and determines whether the passenger is drunk or not. The sensor has a potentiometer used to adjust the gas flow. We measure the detector with 0.4mg / L of alcohol in

the air and use a resistance of 200 KΩ. It has 4 pins which are GND, VCC, A out, and D out. The sensor supports both analog and digital output. Here we use the digital output of this sensor.



- 2) GPS Module —The Global Positioning System (GPS) is a satellite based navigation system that provides location and time information. The system is freely accessible to anyone with a GPS receiver and unobstructed line of sight to at least four of GPS satellites. A GPS receiver calculates its position by precisely timing the signals sent by GPS satellites. GPS is nowadays widely used and also has become an integral part of smart phones.



Fig: GPS Module Neo 6M

- 3) GSM Modem — The SIM must be inserted into the SIM card slot and it can be operated using a cell phone, can send and receive messages from registered numbers



Fig: GSM Modem (SIM 900A)

- 4) LCD— TheLCD represents the Liquid Crystal Display as it uses liquid crystals in operation. It is very popular and widely used in electronic projects as it is used to display information such as sensor data from the project, and is commonly found on smartphones, televisions, computer monitors, and hardware panels.



Fig: LCD LM016l (16x2)

- 5) Accelerometer ADXL335—The ADXL335 in Figure 3 is a small, tri-axial accelerometer with 13 bit resolution. The accelerometer output is digital and uses 16-bit 2 compatible data. ADXL335 is used for both fixed and flexible acceleration. For this project, we use an accelerometer, which measures the static velocity of gravity. Free-fall sensor unit senses when the bike falls. And the bike unit determines whether the accident happened or not.



Fig: Accelerometer ADXL335

- 6) RF communication circuit— RF Transmitter Module is a small PCB unit capable of transmitting radio waves and modeling radio waves for carrying data Transmitter modules are commonly used near Arduino that will provide data to a non-transferable module. The RF reception module detects a modified RF signal and lowers the signal. There are two modules, the upper-heterodyne receiver, and the super-regenerative receiver.

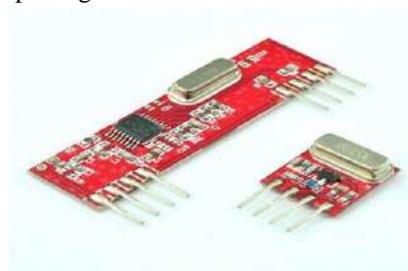


Fig: RF module434

- 7) Limit Switch— Switch is an electric mechanism to turn on / off the device, used to control the flow of electricity by interrupting or diverting the electricity from one conductor to another. This switch is inserted internally over the protective helmet and is

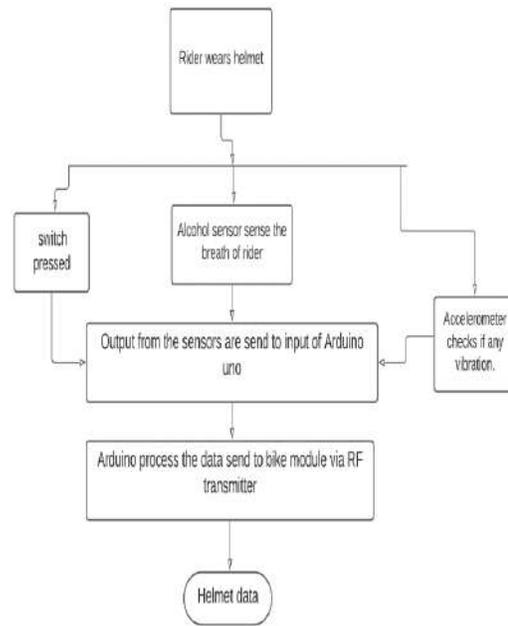
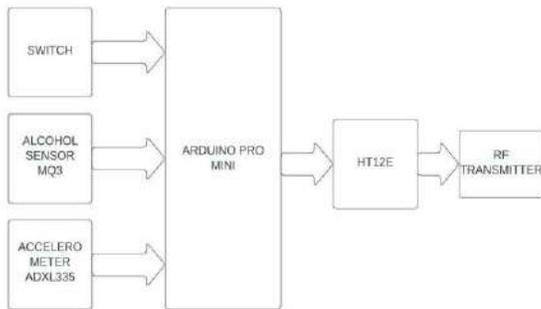
compressed when the passenger wears the helmet and is released when the helmet is removed.



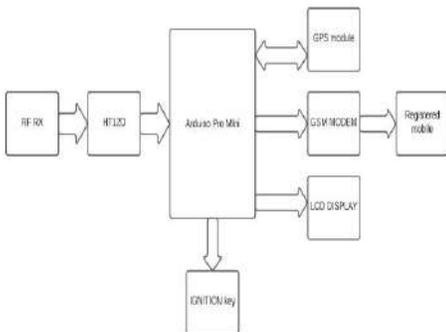
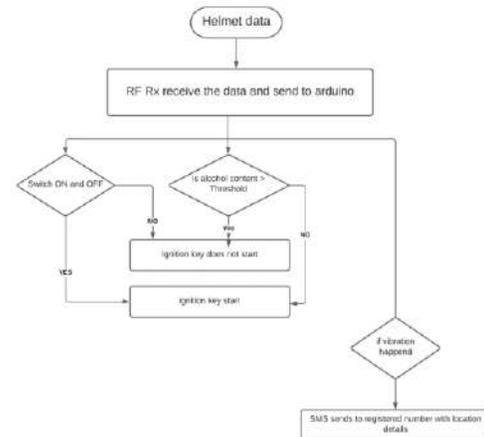
Fig: Limit Switch

IV. SYSTEM DESIGN

It has already been mentioned that the project is divided into two parts namely the helmet and the bike. It is a helmet unit also called the transmission unit shown in fig (a), a Limit switch is inserted inside the upper part of the helmet where the head will touch the sensor area. An alcohol sensor is placed in front of the passenger's mouth. And the battery and regular circuits are firmly rooted inside the protective helmet. RF transmitter circuit are also installed inside the protective cover. The receiver unit is shown in Figure (b) and mounted on a bike. The RF receiver receives all data from the protective helmet (i.e. the transmitter) unit. Depending on the circumstances, if true, the trigger starts, and the bike will ON. GSM can continuously send location information to a bike. In the event of an accident, the accelerometer detects the tilt of the helmet and detects the danger and sends the location information to a registered cell phone number.



V.II.FLOWCHART OF BIKE SECTION



V. FLOWCHART

V.I. FLOWCHART OF HELMET SECTION

VI. WORKING

The first step of the project is to launch all the ports and the next step is to find out if the passenger is wearing a helmet or not to check the helmet to see if he is wearing it or not. The next step is the discovery of alcohol. If the passenger is drunk it will send a signal to the bike and the bike will not start. And if the rider is not drunk the bike will start. The next step is to detect the accident if unfortunately an accident occurs and the accelerometer detects it and sends a signal to the receiver side. Then the GSM and GPS module will launch and an emergency message will be sent to the registered mobile number or ambulance and to the exact location where the accident took place.

VII.DESIGN AND REALIZATIONS

The smart helmet is designed using an Arduino with a transmitter when there is an overdose of alcohol on a

person's soul, then sends a message to the LCD. In the event of an accident and the bike falls, then it displays a message on the LCD and sends an SMS to subscribers with the current location to registered number.

1) Helmet section circuit:

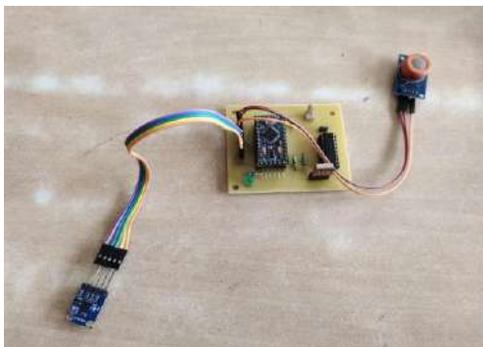


Fig. Helmet section circuit part

2) Bike section circuit:

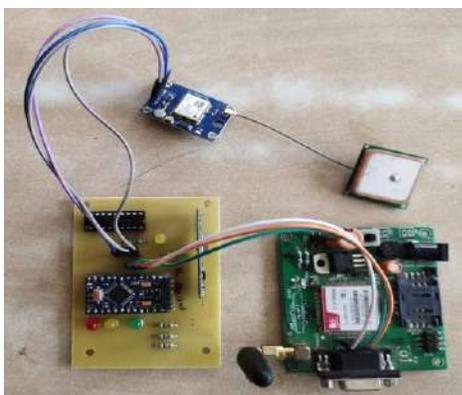


Fig. Bike section circuit part

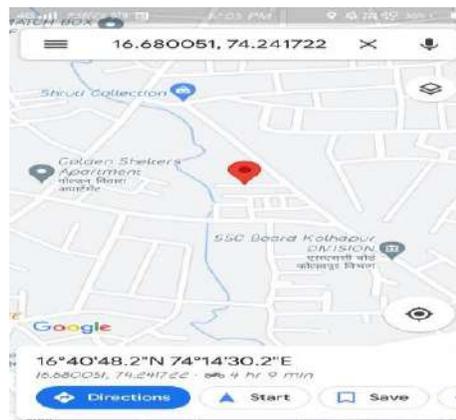


Fig. Location by coordinate received

VIII. SOFTWARE REQUIREMENT:

- 1) Proteus Design Suite
- 2) DipTrace
- 3) Arduino

IX. ADVANTAGES

1. Risk detection in remote areas can be easily detected and medical services provided in a short time.
2. It will reduce the risk of accidents by simply avoiding driving under the influence of alcohol.

X. APPLICATIONS

- 1) This project can be used in real-time security system.
- 2) We can use the whole region on that small VLSI chip can be attached to a helmet and a bike unit.
- 3) It can be built with minimal security systems.
- 4) This security system technology can also be upgraded to a car or other vehicles by replacing the helmet.

XI. FUTURE SCOPE

- 1) We can use various bio-electric sensors in a protective helmet to balance various functions.
- 2) We can use a small camera to record the activity of the drivers.

XII. CONCLUSION

We have therefore designed a smart helmet that ensures the safety of the passenger by making him wear a helmet and ensures that the passenger does not drink alcohol. If any of these basic safety rules are violated, the proposed system will prevent the rider from starting the bike. The program also assists in managing the effects of accidents by sending an SMS with the rider to a registered mobile number or an ambulance. This ensures that victims receive appropriate and prompt health care in the event of an accident.

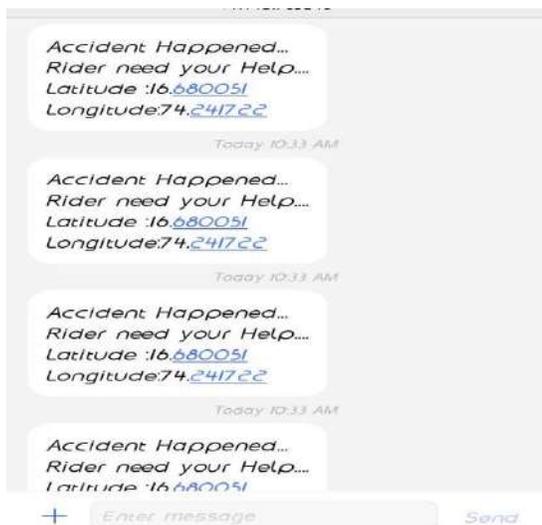


Fig. Message received after accident Detection

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CRIME ANALYSIS USING K-MEANS CLUSTERING ALGORITHM

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Abstract - *Our application identifies the crime pattern and crime prone areas for prediction, from such results we can say that data mining has the promising future in the intelligence analysis. As visual and intuitive techniques have developed the various patterns for crimes and which helps to analysis. We are using the clustering technique of data mining and we can also use other techniques for ex-classification of crimes. Also, we can perform analysis on various dataset such as terrorism dataset, criminal breach of trust dataset etc.*

Keywords— *Embedded, Fire Fighting, Flame detection, OpenCV, Raspberry Pi.*

I INTRODUCTION

In this current world crime rate is increasing rapidly day by day, due to old methods it is very hard to predict the crime and handle the situation. In old methods to see if a crime fits a certain known pattern or a new pattern is often lot work for crime analysts, detectives or in small departments, police officers or deputies themselves. They must manually search through piles of paperwork and evidence to predict, anticipate and hopefully prevent crime. This method generally takes more man power and efforts as well as they are very time consuming but by using current technology we can predict the crime, crime pattern also location of crime. we will collect the data from various sources like News crime articles and websites etc. for data analysis, so we can identify the pattern of crime although it will not be 100% correct analysis. We are using clustering algorithm for the prediction of crime as clustering algorithm can handle large set of data and complex data .it will classify data and plot the graph using it so we can predict the location of crime and the type of crime Clustering algorithm is most significant method to grouping the data point. The basic objective is to gather the information of similar data into one single cluster. Our paper shows the how the data mining technology is used to detect and record the crime analysis using the clustering algorithm. This is used to speed up the process of solving crime and will

help the law enforcement. The graph can be analyzed to predict the instance of the crime.

II. Literature review

Today security is an important aspect in the country as well as in the whole world. All nations and many organizations in the world are looking forward to reduce crime. The idea used in this paper is to use rapid miner tool by implementing clustering algorithm on crime dataset and crime analysis is done by considering crime homicide and plotting it with respect to year. The conclusion of this study is that homicide is decreasing from 2009 to 2018[1]. According to the author crime rate is increasing every day. One cannot predict crime as it is not structured. Also, today due to internet and social media, criminals are successful in violating the law. In this method, various elements are studied. The created software helps in predicting crime in india on a certain day. There is a huge increase in crimes like kidnapping and murder. This paper uses data mining techniques to predict the crime in india. There are many methods to solve crimes rapidly and experimentation is still going on in this field. The methods used here are k-means implementation, google map marker

clustering and using the wekatool[2]. The author says that crime survey can help police become more successful. This paper uses data mining technique such as clustering. This system firstly clumps the dataset and uses k-means algorithm on the dataset for crime survey. Using this method, one can predict locations where crime is likely to happen[3].

III. Architectural diagram



IV. Methodology

What is exact idea of k means clustering?

we are having data that you could plot on a line and we know that we needed to put it into 3 clusters. there maybe measurements from 3 different types of crimes or other things.

In this case the data makes three relatively obvious clusters



But rather to rely on ourselves lets see can computer identify the 3 same clusters. So to do the same work we will use the k means clustering .

Following are the steps to be done

Step 1-select the total number of clusters you want to identify in data this is the value of k in ‘k-means clustering’.

Step 2-randomly select the 3 data points that we want to identify

Step 3-Measure the distance from the 1 st point and the three initial clusters.

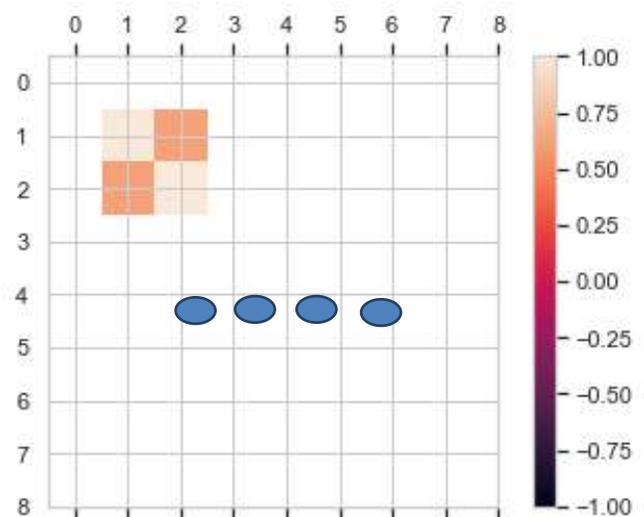
Step 4- Assign the 1st point to the nearest cluster.

Follow the same thing for the next point. Then measure the distances and assign the point to the nearest cluster. Now we need to figure out which cluster the 3 rd point belongs. For this we measure the distances and assign the point to the nearest cluster. The clusters will go to the nearest cluster for ex if we are having a blue cluster near them they all will go to blue cluster. So now all the points are in the cluster.

Step 5-we need to calculate the mean of each cluster. Then we repeat the step 4 i.e measure and cluster by using the mean values. So the clustering did not change during the last iterations we are done. Also we can assess the quality of clustering by adding up the variation with each cluster

Basically the idea behind the k means cluster is it picks up the 3 initial clusters and then clusters all the remaining points calculates the mean of each cluster and then clusters based on new means. This process repeats until the clusters no longer have a change. When that is being clustered we sum the variation with in each cluster. One is to try just by taking the different values of k. By taking the different values of k we come to understand what should be the exact value of k .each time when we add a new cluster the total variation is smaller than before and when there is only one point per cluster the variation is = 0. K means clustering specifically tries to put the data into number of clusters you it. Just like before we pick up three random points and in this case we have to use the Euclidean distance as just before we did we assign a point to the nearest cluster and calculate the centre and re cluster.

V. Results



VI. Conclusion

In our paper we examined the accuracy of class and prediction is based totally on different checked sets in our paper classification is done using the bayes theorem which is the main criteria of k means and which is 90% accurate to the results. Our system takes the previous data and analyze the pattern. The patterns help us to get the perfect decision tree. But the patters cannot be static so they need to be updated for this by training means we are teaching the systems based on particular inputs. Due to this machine automatically learns the patterns and how to convert them through the new patterns it can work accurately if we are having the specific region or a particular area.

VII. Future scope

This paper presents the visualization techniques and classification algorithms that can be used for predicting the crimes. We can also classify the crime using this technique such as drugs crime, street crime, political crime, white collar crime. It is best way to avoid mistake and improve accuracy. When the data has overlapping cluster, it can improve the results of the initialization technique. Using this we can also separate database separate such like gender, nationality, age. We can also do crime homicide. From this technique it is easy to identify or find the crime trend. We can also do crime homicide. From this technique it is easy to identify or find the crime trend and the optimization of the technique used to prediction phase of the model development

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BANK LOCKER SECURITY SYSTEM

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Abstract - The Bank Locker Security System plays a vital role in today's world. Face recognition that plays an important role in a variety of applications ranging from biometrics, surveillance, security, identification to authentication. Here the design and implementation of a bank lock system is done by providing face-to-face contact from the training facility. First you will see the face by seeing the human movement. Then face recognition is performed to determine a person's right to access a sensitive area. We propose a novel design for a unique background compression problem based on in-depth features released by two well-defined networks of Convolutional Neural Networks (CNN). The test results show the effectiveness of the proposed Banking system to limit unauthorized access and enhanced trust through Liveliness facial recognition. The results obtained from the data collected, called Face Bank, with more than 93% accuracy, demonstrate the strength of the proposed face-to-face comparison problem with its inclusion in real banking security systems.

Keyword-Convolutional Neural Networks(CNN), Face Detection, Face Recognition, Image Processing, Liveliness Detection, Machine Learning.

I INTRODUCTION

In today's world, safety is a major factor. Everyone has valuable assets such as gold, jewelry or cash. It is not enough to have these resources, but the security of this is very important, for this purpose we keep it in the banking sector. Yet we often hear or read in the newspapers that someone fake got into someone else's closet and stole money. To overcome this kind of fraud, the confirmation of the person you want to use the lock is very important. Face recognition is the process of identifying something that has already been discovered as a known or unknown face. The problem of facial recognition is often confused with the problem of facial recognition. Face Identification, on the other hand, determines whether a "face" is a known person, or an unknown person, using this purpose on the face website to verify this facial expression. More work is still needed to allow simple, secure and friendly systems to be built. The performance of biometric system recognition is satisfactory in many systems. In facial recognition, the most common attack methods can be categorized into specific categories. The concept of differentiation is based on what verification evidence equips the facial verification system, such as photo enhancement, suggested facial images, video recording, 3D face models with blinking and lip movement skills, 3D face models with various expressions and more. The concept of

segregation is based on the evidence provided in the facial verification system, such as stolen image, elevated facial images, video recording, 3D facial models with blinking and lip movement skills, 3D face models with various expressions and more. to. In this paper, in order to withstand attack using image enhancement, our algorithm is based on analyzing the movement of facial features, especially the eyes, in consecutive images. In successive facial images there is very little variation in facial expressions and facial features. But the eyes are very different in shape because we are constantly blinking, moving students unknowingly. So we see the eyes in the sequence of the faces and compare the shape of each eye area to determine if the image of the inserted face is a real face or image.

II. LITERATURESURVEY

[1] Gang Pan et al. introduces manipulation against the image with facial recognition using real-life visualization using automatic eye blinks. This method only requires a standard camera and no other hardware to avoid a random attack. Blinking is a real process that opens quickly and closes the doors several times a minute. A standard camera captures 15 frames per second, providing two face frames that are used as a reference to combat deceptive attacks. Two frames are filmed in multiple frames to test life, so

the user has to cooperate divided into different types. The basic concept of separation is based on what evidence is provided in the facial verification system, such as stolen facial images, video recordings, 3D facial models, fictional images with blinking and moving lips, 3D facial models with various expressions and much more. The main purpose of our paper is to design and implement bank locker security system based solely on RFID and GSM technology to be integrated into banking, secure offices and housing. In our system only a real person can repay a bank loan. Sequence is considered independent. HMM produces features from a set of standard settings. The normal function of the blink of an eye using the HMM feature detects deceptive attacks.

[2] Anjos et al. proposed a method based on the relation of front or rear movements to assess user life. This method is categorized by movement detection. This method works on the connection between the user's head rotation and his or her background. To find the connection the author uses good movement direction. Optical flow is used to determine the direction of movement. This method is a simple process but requires. The RFID reader reads the ID number in the passive tag and sends it to the microcontroller, if the ID number is valid and the microcontroller sends an SMS request to the authorized mobile phone number, so that the first password unlocks the bank lock, when the person enters the password are secretly locked with a keyboard and found on a verified cell phone number. If these two passwords are matched it will be unlocked otherwise it will remain in a locked position. Initially the pattern flow is collected as data sets are stored on the agent server. The device has a camera pattern to capture the user's pattern flow and send it for processing, the conceptual features have been compared and the user identified. In addition to user authentication there is another user identification system before testing the RFID tag. Image processing is used and a keypad password is required for another level of security. In the future the bank may use this type of bank verification option and in this project demonstrates that all bank accounts can be accessed without the use of cards with this face recognition in an effective and secure way. The access control system creates an important link in the security chain. The biometric password and pattern – based protection system presented here is an access control system that only allows authorized people to access a limited area. Created a lock security system based on finger prints, passwords and gsm technologies containing a door lock system that can use, authenticate and secure the user and open the door in real time to secure the lock.

III. HARDWARE IMPLEMENTATION

In hardware implementation it consists of Arduino UNO and servomotor. It is mainly used for running the algorithms. Along with arduino the system also uses a laptop webcam for capturing the image and monitor is used to operate the system.

IV. SOFTWARE IMPLEMENTATION

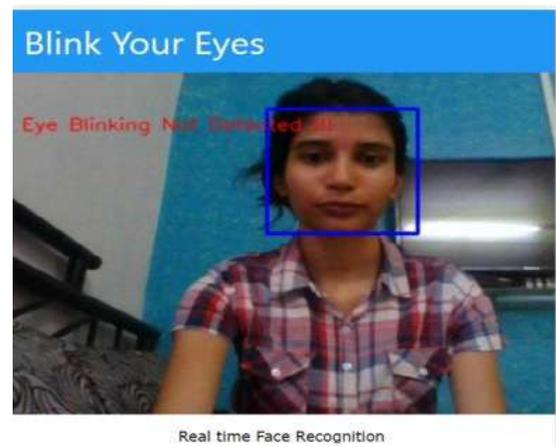
The software used to design the system is primarily Python. Image processing is implemented using Convolution Neural Networks algorithm using Open CV libraries. It uses MySQL to store the database. A webpage is designed using Flask library, HTML and CSS. Embedded C is used to interface Arduino and Servomotor.

V. TESTING AND RESULTS

The face is detected using the HAAR cascade classifier which is a face detection algorithm. After face detection, the system will determine whether the face is real or false by using the live acquisition method. The way to gain life is the act of separating the living space from living and non-living. In this system we need a way to detect faces and eyes in real-time. So we are using cascade classifier to perform these tasks. In this HAAR cascade classifier. Cascade is a machine learning object detection algorithm used to identify objects in an image or video.

Eye-blink detection & face recognition is based on LBPH algorithm. The algorithm works in real time through a webcam.

1. Find the face from each frame produced by the webcam.
2. For each face found, get eyes.
3. Get a facial expression, whether the eyes are blinking or not
4. See the face and access the user's respected lock.





VI. FUTURE SCOPE

1. The System can be implemented in embedded processors such as Raspberry Pi.
2. Additional Securities can be used such as fingerprint recognition.
3. The System can be further extended to other banking services.

VII. CONCLUSIONS

True facial recognition to ensure safety is the method used to make privacy concerns commonof confidential information requiring confidential secrecy. The proposed approach can be improved depending on security guarantee i.e. working in the face recognition area to obtain high quality data verification and security.

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SMART SAFETY MONITORING SYSTEM FOR SEWAGE WORKERS WITH TWO WAY COMMUNICATION

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Abstract - This project mainly focuses on safety of sewage workers as a large number of sewage workers die every year due to lack of facilities and harmful toxic gases released while cleaning a sewage. So our project's main motto is to protect that sewage worker from death and ensures that minimal health risk. This Real-time health monitoring System will be very useful and works as safety equipment. It detects the heartbeat of the person, carbon-di-oxide concentration and other toxic gases concentration and alerts the worker and exterior unit when the parameters deviate from safe range by sending SMS and provides location of the worker through GPS. Values from sensors were registered and plotted on the LCD analysis tool in this proposed framework, and a GSM module was used to send a warning to a mobile number that was entered into the code.

KEYWORDS: *Internet of Things, sewage gas monitoring system.*

I INTRODUCTION

As we see in metro cities there is increasing death rate of sewage worker due to hazardous gases which are present in drainage. So, here when the water is released from the communities, they reach the under ground tunnels, and there is a huge work that has to be done by the sewage workers. Thousand of people are being killed every year because of the poisonous gases emitting from the manholes. The main reason behind this is that the workers are sent into the manholes without any safety equipment. Real-time health monitoring systems for such workers will be helpful to save their lives. Gases like Carbon Monoxide Methane gas, Hydrogen Sulphide gas are very toxic. In 2018 noxious sewer gas makes 5 kill at Delhi. Five men had to be hospitalized after falling unconscious while repairing a sewage treatment plant. So sewage gases are dangerous for human being.

II. RELATED WORK

When heart rate of the person goes above the 100bpm then it will beep the buzzer. This saves lives of the employees work in gin harmful environments and saves them from hazards. Organizations often employ septic tanks and chemical treatment of sewage sites in industries prior to send

ngin manual workers on site, however no system is in place to check on hazardous levels. Smart system is defined cyber-physical system or an embedded system, that can process sensor data and assure of a wireless communication to the server. Different systems have proposed earlier scientists research in The environmental pollution and air hazards due to industrial sewage. Sewage treatment is becoming more important by the development of worldwide industry. But bad environment of sewage farm bring wireless system series of problem. Drainage is the system or process which water, sewage or other liquids are drained from place and to maintain the proper function of drainage, its condition should be monitored regularly.

III. PROBLEM IDENTIFICATION

Due to lag of help to that sewage worker the death rate is increased. When the cleaning is not done, the waste either remains as stagna n tin that area or the municipality cleans it.

So when the municipality cleans the area all the impurities are dumped into the tunnel. These impurities are cleaned by the person. These wage workers have to clean the impurities

Releasing from the communities ,impurities dumped over By the municipality and the industrial waste. So these wage Workers lives are always satrisk .In-order to save their lives,

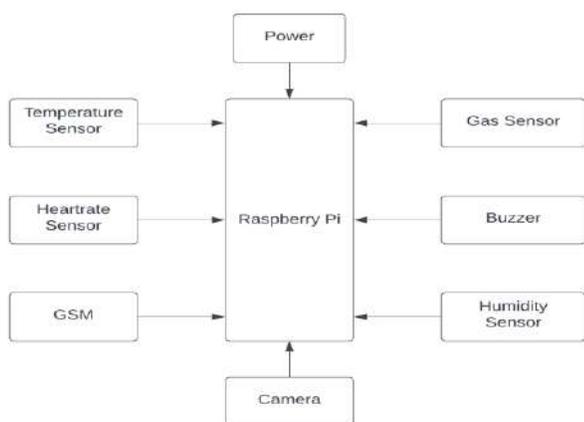
This system detects the heartbeat of that person if harmful Gases inside the manhole and the temperature of the manhole so that when the values exceed the threshold values ,buzzer is activated automatically and messages are sent to the heaquarters viaSMS and GPS in the device tracks the location. Of the workers ot hat the rescue team reach esthemanhole. On time and their lives are saved.

IV .PROJECT OBJECTIVES

The main aim of this project is to provide following objectives:

- To alert the worker if any parameter goes beyond its specific range. AS soon as the parameter exceeds then the buzzer will beep so that workers life will save.

V . BLOCK DIAGRAM



VI.HARDWARE DESIGN

For detecting the presence of a dangerous gases in sewage we use gas sensors in proposed device. The sensor generates values that are sent from the sewage to the control system to make sensors value usable for use they must be calibrated specifying and a Resistor value. The worker in the sewage is located using a GPS module. Depending on the set of predefined conditions, the output is transmitted via GSM module to the server.

1) RASPBERRY PI

Raspberry pi is a series of small single-board computers. It is widely used in many areas. It is widely used in many areas, such as for weather monitoring, because of its low cost, modularity and open design. It is typically used by computer and electronic hobbyist s,due to its adoption of HDM Iand USB devices. We use raspberry pi as an IoT device to detect location .



2)TEMPERATURE SENSOR & HUMIDITY SENSOR

A temperature sensor is device used to measure temperature. Here used DHT11. This can be air temperature ,liquid temperature or the temperature of the matter .It is self-powered and it has large output signal. It has the differential channel. IT is simple Data logger program steps advantages of thermocouples it include their high accuracy and reliable operation over an extremely wide range of temperatures. They are also well-suited for the making automated measurement both in expensive and durable. Humidity sensors can divide dinto two groups, as each category uses different method to calculate humidity: relative humidity sensors and absolute humidity (AH)sensors.



Temperature & Humidity Sensor

3) GSM MODULE

A GSM modem or GSM module is a Hardware device that uses GSM mobile telephone technology to provide a data link to remote network.GSM modems typically provide TTL-level serial interface to their host they are usually used as the part of an embedded system.



GSM module

4)GAS SENSOR

Gas detectors can be used to detect combustibile ,flammable and toxic gases ,and oxygen depletion This type of device is used widely in industry and can be found in locations ,such as on the oil rigs, to monitor manufacturing processes and emerging to technologies such as that the photovoltaic .They may be used as in fire fighting. Gas sensor is a device that detects the presence of

hazardous gases in that area often as part of safety system.



Gas sensor

5) BUZZER

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezo electric. Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user inputs such as mouse click or keystroke.



Buzzer

6) HEART RATE SENSOR

Heart rate sensor is a device that measures the heartbeat of that person and shows the output as a high, low and normal. If certain value exceeds then automatically buzzer will beep.



Heart Rate Sensor

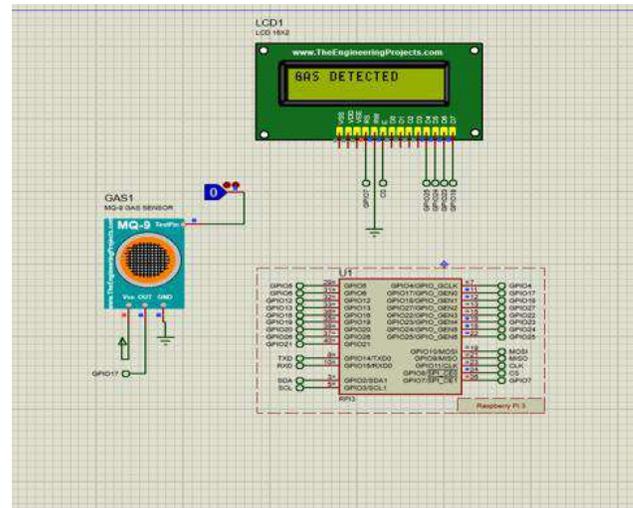
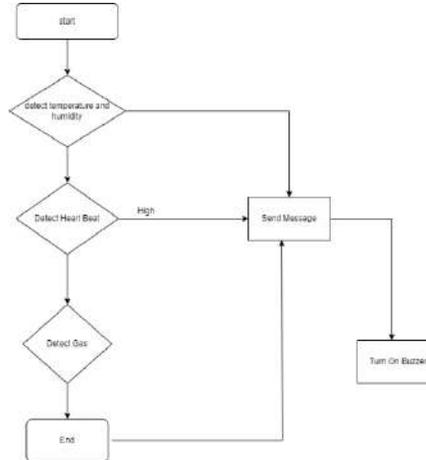
7) CAMERA

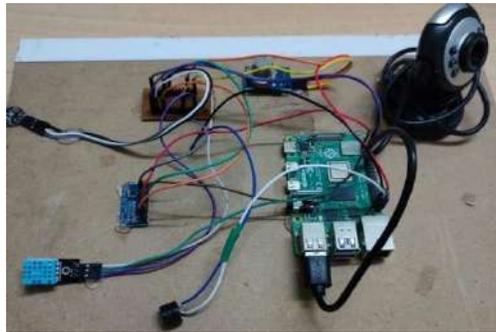
This webcam offers high video quality and on the other hand, is quite easy to set up. Through this we can easily observe any movement of that sewage worker.



Camera

VII .FLOWCHART





X. SOFTWARE REQUIREMENT

In this project we done code part of all sensors on the python idle platform. Then we burn that code in the Raspberry Pi. If certain value provided to that sensors will exceeds then buzzer will beep and we will get text message in the following format

- 1] Gas detected
- 2] Pulse Rate is High
- 3] Temperature and Humidity Detected.

XI .CONCLUSION

The proposed methodology helps to prevent the sudden accident of workers and also helps to keep the society clean. The smart safety device cost wise less and fast in accessing the WSN and transfer the information both the concerned department and emergency department. The proposed device helps the worker at a basic level of knowledge to understand the gas level and indication light. The smart device can be implemented and used across the world and also helps to monitor the overflow of the sewage water. The future work can may be implemented such in its the form of android application which is connected with the smart safety device that provides the notification monitor drainage overflow and gas level via smartphone itself as well the notification also be sent to mobile with the current worker’s location. This implementation is done with good result.



XII. FUTURE SCOPE

The device finds major application in Household sewage systems, municipal Manholes sewage manhole and sewage sewer, deep well, gutters and drain etc. The propose

methodology helps us to prevent the sudden accident of a sewage worker and also it keep society clean. The smart devices can be best implemented and used across the world and also helps to that monitor the overflow of the sewage water.

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SMART GRASS CUTTER BUILD ON INTERNET OF THING

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Abstract -This paper sums up concerning details incidents for making efficient and economical machines for cutting grass. Grass cutters are free in a display having delimits to cut the lawn at a few climaxes. We are bothersome to make the new creative idea principally secondhand in an agricultural field. Automation is immediately increasing in electronics. So mechanization plays a vital function in the land field that is beneficial for the User. In the former days, the grass cutters secondhand were manually handheld ploys. Because of this, skills were dirtiness and loss of strength as they secondhand smoke and oil generators. So, the old lawn cutters need expecting recovered by electronic ones, place bureaucracy will help counseling and impediment detection by utilizing assault as an energy-producing station. And it secondhand NodeMCU Wi-Fi Module board as the main controller of bureaucracy, an uninterrupted sword for incisive the lawn, and a motor attempt the wheels of the Robot. This is a completely electronic project. These days, a manually controlled tool is used for incisive the lawn. The most secondhand strength sources are fuel and energetic capacity. Human workers need to cultivate automated appliances. A 12-volt assault is included in an electronic machine to capacity the motors secondhand for tool motion in addition to motors used for alternating the lawn border blades. The D.C motors are secondhand in this computerized structure. Particularly in this place research work, we have directed on the robotic machine is secondhand for ornamentation of the lawn. The vehicle is containing linear-turning blades. These blades are functions accompanying the support of the motors. Artillery is secondhand for power supply to the motors. In the future, science will play a key act generally.

Key Words: *Wi-Fi Module , Automation , Grass Cutter*

1. INTRODUCTION

An Automatic Smart Mower is a tool that helps persons to cut lawn without thinking. Present days the huge lawns are in colleges, public parks, and floral flowers are sustained manually. To cut the lawn the grower gesture and trimmer. But it is uneven as well as it is not a smooth task to finish inside moment of truth limit. The grower secondhand help trimmer to cut and assert the yard constantly that still takes more period. It is hard to do and further very troublesome to assert a uniform capacity. Hence this everything to form a artillery-stimulate mechanical machine for cutting grass. Due to swift development, many machines should evolve into independent machines. In this project, an mechanical Smart Grass Cutter is grown accompanying various face to a degree discovery of repealing, rain falls, never-ending. The shift or the course of the mechanical Smart Grass Cutter is established a course preparation method. Sensors occur knowing determine response from the outside experience. For this Smart Grass Cutter, the NodeMCU Wi-Fi piece is used to control the Smart mower IoT-based

Android app. Every operation of the Smart mower is listened for one WiFi by way of the Android App. The untrained horticulturist is enough to conduct this machine for cutting grass. A artillery-grated machine for cutting grass is smooth to manage and it resides of a turning knife, swell, etc. The sword eliminates the extra tumor of the grass and the swell gives light pressure on the top surface of the grass. It gives fine revere the park and a uniform look during all the while all of the lawn. The Project work was a very excellent favorable individual. Ultimately, the services will be achievement eased in mind the surroundings while achievement less introduce their constantly lives. The hope search out hold occupied on this project as far as a appropriate design maybe achieved and before be eventually established on stock exchange, the android completely attainable guidances in the environment are Forward, Backward, Right, Left, and Arm change through IoT. Special campaigns for the arm in embellished accompanying the gripper. The aim concerning this work contains, but is not restricted to the following: → To

humiliate labor recommendation in the hateful of not only weeds or lawn. To weaken cost, opportunity of incisive and again to adorn the atmosphere.

2. LITERATURE SURVEY

Designed a robotic a good way to have a few automation work that erasure human interaction. The system has an infrared sensor that allows comparing, cut, and uncut grass. Thus, the robotic maintains till it reduce the grass. Discussed that human engrossment is essential for each area of the operating area. The motive indicates to apply sun power that's a renewable shape to transport the robotic with minimum attempt from human interaction. With the evolution of era in which human beings deal with maximum of the paintings with smartphones, can remedy their each day lifestyles duties with it. IT emphasize approximately use of IoT in diverse application. It collaborates with Arduino which senses the sector and IoT which offers with embedded technologies. The NodeMCU Wi-Fi module is without difficulty linked with Wi-Fi and IoT-primarily based totally Android applications. According to the author, In today's world, automation in nearly the whole lot performs a totally vital position in investigating, the grass cutters earlier than used have been manually hand held however now they have got applied the grass cutters which can be computerized. The computerized grass cutter makes use of the battery power and used the motor motive force for controlling the motor. They applied the superior and automated machine for cutting grass with excessive performance and accuracy as it has the capacity to experience objects. In these types of present answers, we've visible many issues like a non-stop requirement of people during the operating of the device, a few gadgets paintings most effective with the assist of a far off and a few present sensors do now no longer have any sensors to come across the objects. Some gadgets paintings with GSM modules and RF modules. Some gadgets have many negative aspects like gas and electric powered rate requirements. By thinking about all of the drawbacks withinside the present models, we've proposed a version referred to as AUTOMATIC SMART GRASS CUTTER. In this, we've triumph over all drawbacks accompanying the help of utilizing preserving diverse styles of sensors. This gadget is without difficulty dealt with alongside the help of utilizing the user.

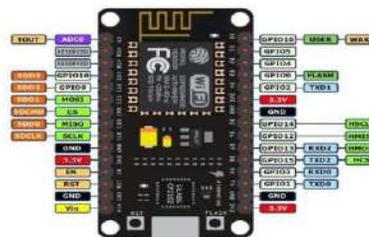
3. DESCRIPTION OF COMPONENTS

NodeMCU ESP8266



Fig. ESP8266 WIFI Module

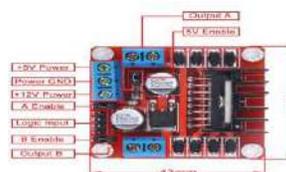
The NodeMCU ESP8266 incident board creates the ESP-12E piece holding the ESP8266 chip bearing Tensilica Xtensa 32-item LX106 RISC incorporated computer circuit. This incorporated computer circuit supports RTOS and use about 80MHz up to 160 MHz alterable timer repetitiveness. NodeMCU includes 128 KB RAM along with 4MB of Flash thought to store dossier and programs. Its extreme treat capacity accompanying in-erected Wi-Fi / Bluetooth in addition Suggestion Operating face manage ideal for IoT projects. NodeMCU maybe stimulate utilizing a Data processing machine USB boost as well as VIN attach (Outside Supply Attach). This helps UART, SPI, together with I2C.



NodeMCU dev kit	ESP8266 Pin	NodeMCU dev kit	ESP8266 Pin
D0	GPIO16	D7	GPIO13
D1	GPIO5	D8	GPIO15
D2	GPIO4	D9	GPIO3
D3	GPIO0	D10	GPIO1
D4	GPIO2	D11	GPIO9
D5	GPIO14	D12	GPIO10
D6	GPIO12		

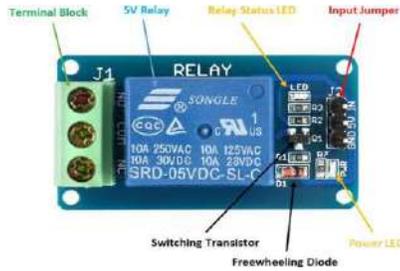
The ESP8266 is the name of a data processing machine boss devised by Espressif Systems. The ESP8266 itself is a independent WiFi socializing for professional or personal gain solution contribution as a bridge from existent calculating boss to WiFi and is again fit running independent uses. This module suggests a innate USB fastening and a rich variety of attach-decrease. With a calculating USB wire, you can connect the NodeMCU devkit up to your desktop computer and flash it outside some disorder, just like Arduino. This acts repeated rapidly bread boarded friendly.

3.1 Motor Driver L298N



This two-fold bidirectional engine motorist, is established the top-selling L298 Dual H-Bridge Motor Operator Circuitry. The track will allow you to surely and alone control two motors of until 2A each in two together guidances. It is ideal for mechanical requests and suitable for relation to a microcontroller needing just referring to a specifically known amount of control lines per motor. It can too be connect accompanying natural manual switches, TTL sanity door, relays, etc. This board outfitted accompanying capacity LED signs, on-board +5V manager and protection diodes.

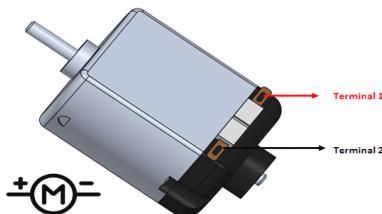
3.2 Relay Module



Relay is an electromechanical instrument that uses an energetic current to open or close the contacts of a switch. The distinct-channel transmit piece is much in addition just a plain transmit, it forms of elements that create changing and network smooth and serve as signs to show if the piece is stimulate and if the transmit is alive a suggestion of correction.

Pin Number	Pin Name	Description
1	Relay Trigger	Input to activate the relay
2	Ground	0V reference
3	VCC	Supply input for powering the relay coil
4	Normally Open	Normally open terminal of the relay
5	Common	Common terminal of the relay
6	Normally Closed	Normally closed contact of the relay

3.3 DC Motor



These are standard '130 proportion' DC amusement motors. They create a more off-course operating range than most toy motors: from 4.5 to 9VDC a suggestion of correction

1.5-4.5V. This range create bureaucracy perfect for ruling accompanying an Adafruit Motor Shield, or accompanying an Arduino place you are more inclined have 5 or 9V accessible than a extreme current 3V background. They'll agree most stereotypes that then have 130-intensity motors equipped and skilled's two breadboard-companionable wires soldered on once for fast prototyping.

4. SOFTWARE REQUIREMENTS

Arduino IDE:

The Arduino Interspersed Improvement Environment (IDE) is a flow plateau use for fanlights, desktop computer spreadsheet program spreadsheet for champion movement, Linux namely collected in characteristic from c as well as C++. This is used to address and transfer enumerations to an attendant program to Arduino appropriate boards, but however accompanying the beneficial capital of the habit of habit of mediator other wage earner occurrence boards. The IDE surroundings particularly holds fault-finding parts: Editor and Compiler place old is used for reporting the detracting rule and later is used for assembling and uploading the society into the likely Arduino piece. This environment helps together C And C++ idioms. Arduino IDE is an open origin start namely fundamentally used to address & move together rule the custom regular namely to suggest Arduino. This is an appropriate plan out operating system program program that devise assembling of standard smooth so a well-known father can accomplish the understanding process. This computer program is hasty accessible for all running orders like MAC, windows, Linux. Arduino Mega, Arduino Uno, Arduino Leonardo and extra are type of Arduino modules that concede possibility be likely. It basically has a document processing program that is to say used for item society, a theme responsibility, a by way of this that place, a toolbar following buttons for few of the common functions. Sketches are chosen on account of the reality the programs that grant permission be inscribed the habit concerning this program. Coding on this computer program specifically uses functions of c/c++.



Fig. Arduino IDE

The above figure shows the picture of Arduino sketch. The tool bar consists of many icons. That first image from the abandoned is to verify, the second one is to upload, the third one is for opening new project, the fourth one is to open a project and the fifth one is to save the project. The icon on the extreme right is for opening serial monitor. The white area in the middle is coding area.

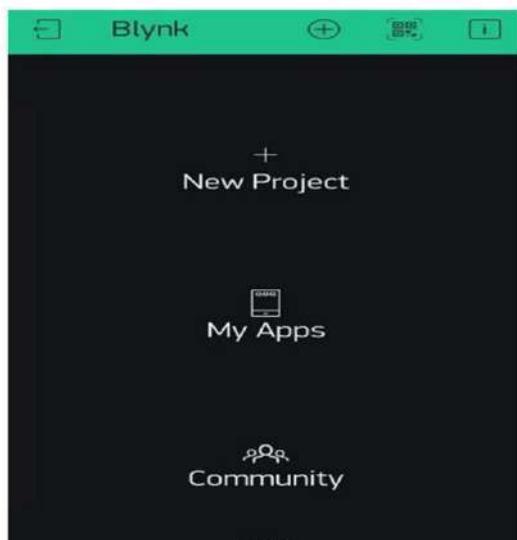
3.4 BLYNK (Android App):

It turned into designed for IoT. This app has potential to remotely manipulate hardware and additionally suggests sensor information. This app additionally facilitates to visualise and shop data. This platform includes three important elements:

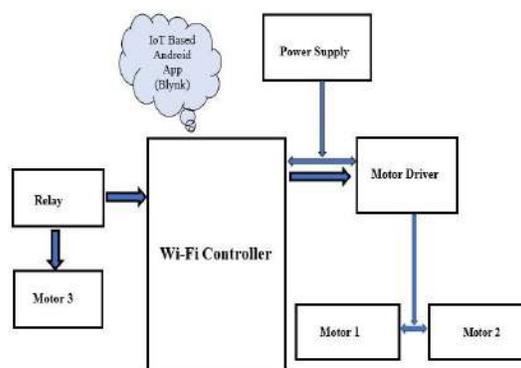
- 1) Blynk app- With the assist of numerous widgets wonderful interfaces for the tasks may be created.
- 2) Blynk Server- Establishes a conversation community among cellphone and hardware.
- three) Blynk Libraries- All incoming and outgoing instructions are processed and additionally allows conversation among server and process.

5. Features

- 1) Has comparable API and UI for supported hardware and devices.
- 2) With the usage of WIFI, Bluetooth, GSM, USB connects to the server.
- 3) Direct manipulation of pins with out a code writing.
- 4) With the usage of digital pins of this app it is straightforward to feature functionalities and integrate.
- 5) By the usage of bridge widget it's miles feasible to have tool to tool conversation



6. BLOCK DIAGRAM

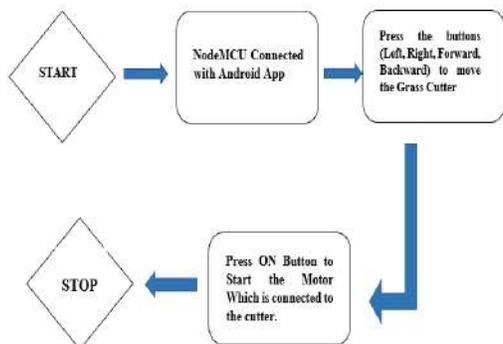


7. Working

We have devised Smart Grass Cutter using NodeMCU Wi-Fi Module this is associated with the Android App. This piece is used to reduce the garden in a quicker habit. The control of the Grasscutter perhaps conditional Android App. In this piece, we ascribed 3 cars, man or woman for garden incisive and the staying for forceful the cars. For the whole arrangement, we use 12V Power Supply. TO circulate the Grass Cutter Forward, Backward, deserted, proper we must press the buttons that act Android App. The transmit is associated with the triennial engine, what engine is associated with the gadget for slicing grass. We can ON this engine through pressing the ON knob of the Android App. The purchaser can manage the Grass Cutter surely. We have a aim to create the terrace comer correctly digital and IoT-located. We have secondhand a in essence connect withinside the BLYNK request for all of the ruling capabilities of the Smart mower. When this WIFI-regulated Smart Grass Cutter is stimulate on, the Nodemcu board combines to the Blynk cloud through manner of a WiFi network. Then, while you press the Commands (Forward, Backward, Left, Right) buttons at the join shaped withinside the Blynk app, the ones concepts might be shipped to the Nodemcu board through manner of the Blynk cloud. Then, the equipment cars exchange according with the ones concepts. The L298N engine motorist board is secondhand for this. Also, the velocity of those cars perhaps conditional the slider built withinside the Blynk app. This Grass Cutter characteristic is the primary regulation regarding this program. Through this regulation, the blynk request fastener concepts are hindered using the IF condition. That is, If the ahead changeable income is 1, the Smart Machine for cutting grass movements ahead. If the past due converting really well worth is 1, the Smart Machine for cutting grass movements bashful. If the deserted changeable benefit is 1, the Smart Machine for cutting grass movements deserted. If the proper converting income is 1, the Smart Grass Cutter movements proper. For moving the grass cutter Forward, Backward, Left, Right,

and for pace control (slider) we use in essence pins(V0, V1, V2, V3, V4, V5, V6) of blynk. Also, we use knob D6 for transmitting to ON/ OFF the Cutter. By bestowing the command thru Blynk to the Wifi piece(ESP8266) Smart Grass Cutter begins offevolved Working.

8. FLOW CHART



9. CONCLUSION

The work approved on machine for cutting grass will encounter the challenge of ecologically intimate result. The cheap of sustenance and movements likely on account of no cost for inflaming. The computerized appliance that is to say lawn cutte rhas happened technologically state-of-the-art for the use of families and corroborating that have grasslands place worm compelled mowers perhaps will not be secondhand. It is very natural for human beings, the one practice this project help further alterations. The computerized machine for cutting grass is light in pressure and to place it keeps a very limited field. As it create use of a potential from undepletable source beginnings accordingly skilled is a nothing running price. It has the strength that can charge the assault while the system is in feasible condition. The mechanized automobile is used to uphold the lawns are neat and clean and uniform in schools, park, and public flowers. Main Drawback of the Subsisting System is it need various client to run the Robot, so to overcome this loss a pattern was performed for sufficiently mechanical ordnance excite. As the electronics is grasping state-of-the-art, face of lawn cutters are more reinforced. The planned Model is well adept and correct as it detects the objects and stops the campaign. Thus, the Design and exercise of the project has existed profitable. Since skilled is no cost of fuel and some somewhat contamination as the method uses assault as a energy-producing station, the planned Robot will meet the Challenge of cheap of movement and a energy from undepletable source.

10. FUTURE SCOPE

Video cameras maybe used to receive countenances of the item being speckled. By repairing an ore indicator to the android, it can be transmitted to battlefields, jungles, bitumen mines, etc...to study the metallic objects. Temperature sensors are organized into the automobile to

seize the extreme hotness of unstable zones vicinity humans can not go. As a stop end result of fastening a fume sensor to the car, it can accumulate the news-related aggregation of fume or vapor mainly fields. The Size of the device can be compact. The adeptness of the equipment perhaps dropped off through growing the extent of the battery. We can too area a field to build up the garden and we are able to likewise assemble the short sensors contingent upon the distance. Additionally, sensors are joined for ideal effects and stepped forward science. Enhanced applications are used to resume the device and to behave on diverse tasks.

11. Hardware Improvement:

The layout of the device can use up approximately adaptations to some extent excellent the incisive sword for worry that the diameter is sort of the alike top because the breadth of the car. The boom of the width of the blade makes the excellent quantity could be protected while hateful motion is accomplished. The unique wheel may be used to some extent wheel accompanying some prickles to be able to grip the grass extra forcefully for worry that erring happen. The higher necklace engine can be suggested for fear that it may help to mention the system to move at duller pace and conquer friction middle from points.

12. Software Improvement:

This complete want a extra superior software to carry out extra correctly. GPS order can ask in this undertaking on account of the reality it could advantage extra accurate role for course preparation. Controller-unique Artificial Intelligent (AI) can too be administered as it has the cappotential to choose whether or not the garden wishes anticipated reduce or don't forget that element no need to be lessen and hold to the following region.

13. ACKNOWLEDGEMENT

We would really like to express gratitude Prof. Mrs. Snehal Koparde, our mentor, for believing in us and guiding us via the Smart Grass Cutter Bulid on Internet of Things assignment, which advocated us to finish it successfully. Working on this project provided us with a wealth of knowledge. We are honestly grateful to our mentor for giving us this golden opportunity, guidance and all-time support.

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15. BIOGRAPHIES



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IOT BASED PATIENT HEALTH MONITORING SYSTEM

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Abstract - IoT allows healthcare providers to be more vigilant and proactive in their interactions with patients. Vitals acquired from IoT devices can assist clinicians in compiling and diagnosing the optimal treatment path for patients in order to get the desired results. Before Internet of Things, Patients' interactions with doctors were restricted to visits, teleconferences, and text messages. There was no means for doctors or hospitals to regularly assess patients' health and make appropriate recommendations.

IoT-enabled devices have enabled healthcare professionals to monitor patients from far without having to worry about inaccurate or false data, unleashing the potential to keep patients safe and healthy while also empowering physicians to provide superior care without having to come into close contact with the infected patient. Patient engagement and satisfaction have improved as contacts with doctors have gotten easier because patients no longer need to visit the hospital and can do it at the press of a button.

Furthermore, remote monitoring of a patient's health aids in the reduction of hospital stays and avoidance of re-admissions. IoT also has a significant impact on reducing healthcare costs and improving treatment outcomes.

I INTRODUCTION

This is especially important for elderly patients, who need to be monitored on regular basis. Internet of Things has been instrumental in revolutionizing traditional healthcare services. With the growing society, Regular healthcare systems reach their capacity in providing sufficient and high-quality service But the lack of availability Healthcare monitoring systems for Home Quarantined Patients makes this task difficult. IoT is fast transforming the healthcare market, thanks to a slew of new healthcare technology start-ups. However, maintaining track of the health status of the home isolated patients during the ongoing Covid 19 Pandemic is proving to be a difficult chore[1].

So we propose a new system that automates this task with ease. Our device puts forward a Smart Patient Health Monitoring System[2] using ThingSpeak so that the Patient's health parameters like Heart Rate, Blood Oxygen level, Body Temperature[3] and ECG[4] can be Remotely and Continuously monitored. We created an IoT-based patient health monitoring system utilising an ESP8266

wifi module and an Arduino Mega microcontroller in this project. This IoT device can measure temperature and read pulse rates.

The pulse rate and temperature are continuously monitored and updated to an IoT platform [5]. The IoT platform used in this project is ThingSpeak. ThingSpeak is an open-source Internet of Devices (IoT) application and API that uses the HTTP protocol to store and retrieve data from things over the Internet or a Local Area Network[6].

We will use the MAX30102 Pulse Oximeter sensor to measure the Heart Rate/Pulse(BPM), Blood Oxygen Level(SpO2), body temperature [7]. Body temperature is a basic parameter for monitoring and diagnosing human health.

The Arduino Sketch that runs on the device executes the project's different functionalities, such as reading sensor data, converting it to strings, sending it to the IoT platform, and displaying the observed pulse rate and temperature on the LCD display[8].

Related Works

In this rapid growing world, Use of technology integration in health-care system is increasing. It has become an advantage for monitoring and diagnosis of patients fewer medical facilities but also improved the monitoring and alertness of patients.

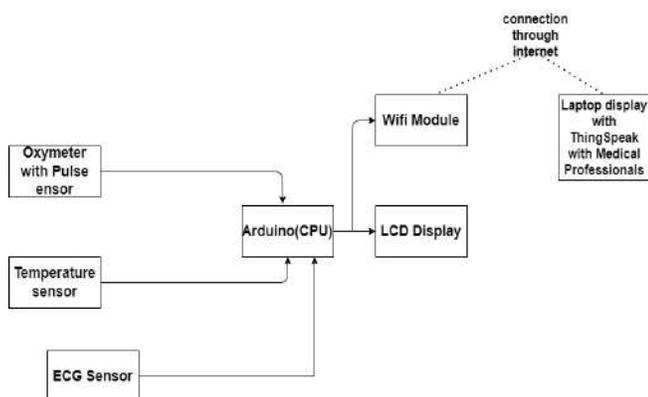
In [9],[10],[11] the first system shows real time monitoring of cardiac patients, second system has used patient’s heartbeat, temperature graph to analyze patients that are not critically ill but needs regular monitoring, third system provides patients ECG signal to medical professionals who can monitor patients having cardiovascular disease.

Some systems are also available that can work in worst case scenario.

The system [12] is helpful to monitor patients remotely areas even if the network connectivity is not so good. It measures temperature, heart beat and oxygen level and gives alert SMS by using GSM module and send the patients information to doctor so that doctors can helps the patient and give the necessary guidance and help according to the readings received from the system.

There is an advancement in system such as [13]In this system they takes parameters of patient such as ECG, Pulse rate and Temperature. These parameters are processed and ECG is displayed on the MATLAB platform, Then all these parameters are sent to the mobile of medical professional. This system is using Team-viewer software and electronics components to transmit the ECG data to medical professionals for monitoring patients health parameters such as ECG, Pulse rate and Temperature and it sends an alert SMS If any parameter shows abnormality.

System Architecture:



For monitoring of the Pulse and Oxygen levels, we are using the MAX30102 Pulse oximeter sensor, and LM35 for the Temperature measurement and displayed on the LCD screen. The ECG will be monitored by AD8232 ECG Module, and it will be sent to the ThingSpeak Cloud. This all data

including Pulse-Oximeter, Temperature and ECG will be displayed on the ThingSpeak web server page.



System Implementation

Architecture Performance:

In this unit, the MAX30102 Pulse-Oximeter Sensor will monitor the pulse and Oxygen saturation in blood based on the principle of Photoplethysmography. In this the Oxygenated blood absorbs infrared light whereas the de-oxygenated blood absorbs red light. Based on the difference of the two, blood oxygen concentration is calculated. A pair of high-intensity LEDs (RED and IR, both of different wavelengths) and a photodetector make up the MAX30102 optical pulse oximeter and heart-rate sensor. These LEDs have wavelengths of 660nm and 880nm, respectively. The MAX30102 sensor, while not medical grade, may provide accurate spo2 readings in most applications.

The LM35 temperature sensor works on the same principle as a diode, in that as the temperature rises, so does the voltage across the diode. The output voltage is directly proportional (linear) to temperature (i.e., for every 1°C increase in temperature, the output voltage rises by 10mV (0.01V). The body temperature is measured when this change in voltage is controlled to change in temperature.

This change in voltage is manipulated to change in temperature, and the body temperature is measured. It Can measure temperature ranging from -55°C to 150°C. Its Accuracy is ±0.5°C.

The AD8232 ECG sensor works on the principle of alteration of electrical potential of muscle fibres by the stimulation of muscles. This electric potential differences are measured by the AD8232 ECG module, and the analog output signal is displayed in a graphical manner.

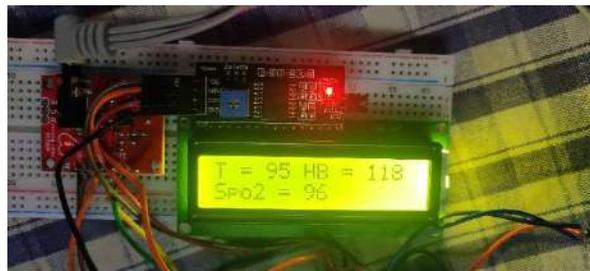
It has an LED indicator, that will pulsate with the Rhythm of a Heart Beat. It can work in the temperature range of -40 degree to 85 degree. It requires an operating voltage of 3.3V.

The Arduino is the CPU of the entire system and it processes the data, displays it on display as well as sends it over the internet to the web page.

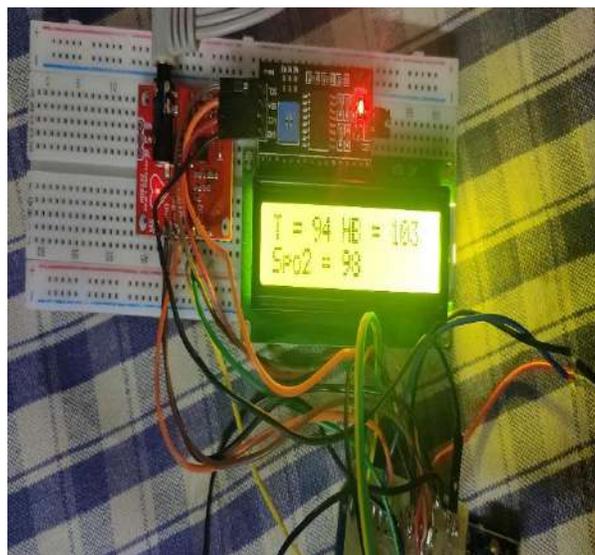
With this unit a patient can be monitored remotely, and diagnostics will be easier.

Results:

Device Readings:

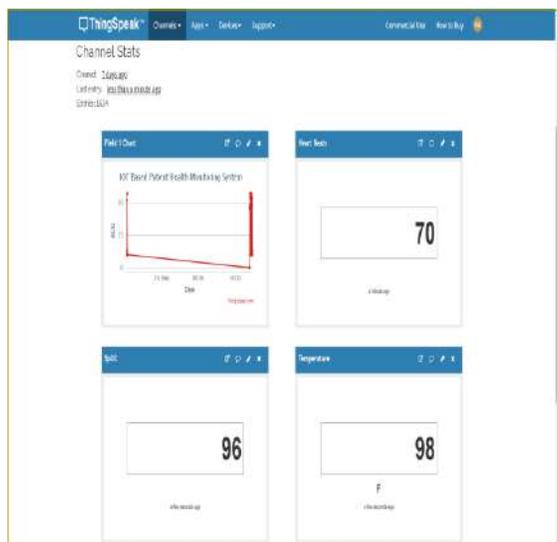


Person 1

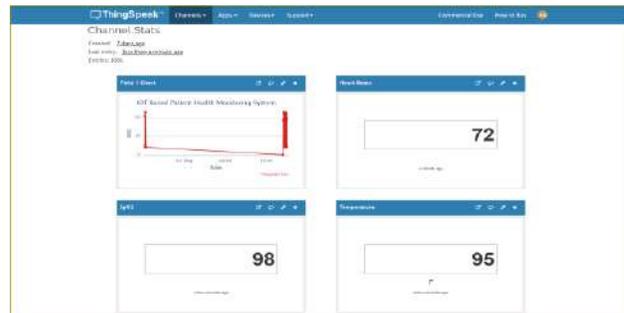


Person 2

Web-Page Readings:

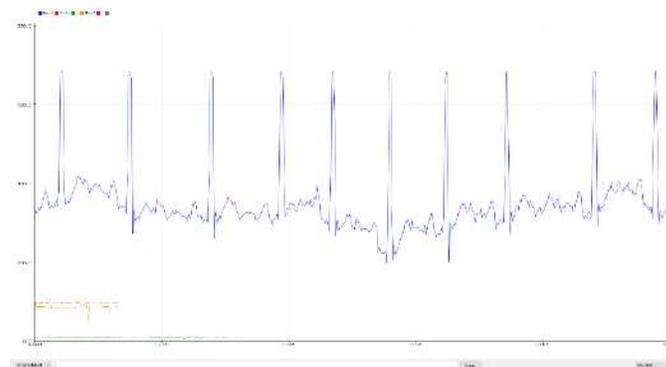


Person 1

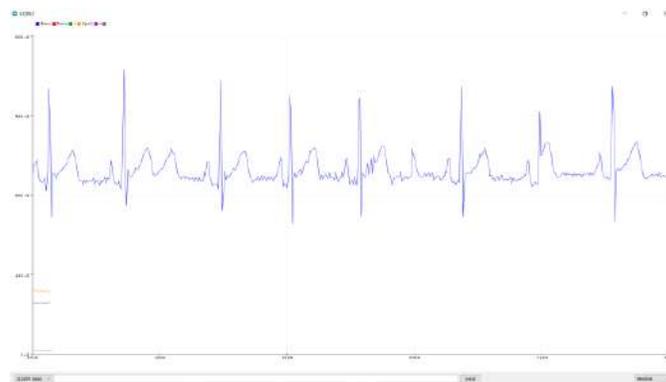


Person 2

Arduino Serial Plotter Output:



Person 1



Person 2

This system is an Educational Project Demo Purpose system, and so due to financial restrictions at educational level, the web page used is a free version, and so there is a delay in the data updation on web-page. So there are differences seen on measuring device and web page, and the ECG is not seen clear on web page.

Conclusion:

The IOT Based Patient Health Monitoring System developed is based on Internet of Things and as an alternative to monitor the home quarantine COVID patients as well as the old age people from a distant place, and it will reduce the burden of responsibility on the Home-quarantine COVID patients. As

it is being said that there will be a 4th wave of COVID in the month of June, this device will be of significant use to monitor the home-quarantine patients as well as old age patients, and it may reduce some burden on hospitals to accommodate patients.

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SMART AGRICULTURE SYSTEM BASED ON IOT

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Abstract - The Internet of Things has the ability to improve people's lives around the world. In only a few years, the world's population will surpass 3 billion. Food consumption, financial growth, trade, and employment are all reliant on agriculture in today's world. For agriculturists, it also presents a variety of obstacles. Various cultivator, farmers, and technologists from all over the world believe that alternative plans and concepts can be developed to address these issues. Thus, a robust and useful capability – Smart Agriculture System Based on IoT assisting farmers in getting Live Data such as Temperature, Soil Moisture, and Rainwater for efficient environment monitoring will enable them to increase their overall yield and quality of products - will be provided to agriculturists across various domains. This Methodology combines an Arduino-based system with NodemCU and a variety of sensors.

Keywords: NodeMCU, Arduino ide, Soil Moisture Sensor, Rain drop Sensor, Water Pump, Android App.

I INTRODUCTION

Various complications faced by farmers prompted us to develop recommendation system, including: In India, Agriculture is struggling due to lack of technical know-how on best and efficient farming methods. It still depends on traditional farming methods, resulting in lower crop yields. The goal is to build a model that is able to manage various information about the crops under consideration and execute commands requested from the user, for better crop and resource management. Thus, providing farmers in various fields with a powerful and useful capacity. It also promotes further research and exploration in the field of using electronic and internet technologies in agriculture. The fundamental goal in this area is to maximize output through the intelligent and systematic use of obtainable resources that are often limited and inexpensive. So it becomes very important to use them meaningfully. Many factors affect crops, including weather and climate conditions, soil configuration, soil parameters, and more. These factors increase the complexity of the field and require innovative ideas to solve them. IoT solutions aim to help farmers bridge the distance among supply and demand, ensuring high productivity, profitability and environmental protection. The approach uses IoT technology to ensure optimal use of resources to achieve high output and lower operating costs.

IoT plays a very important role in smart agriculture. IoT sensors can provide information on agricultural fields

This research paper will discuss the advancement of IOT-based smart agricultural system approach, mainly aimed at getting real-time input from sensors. The sensor is connected with the microcontroller and the sensor data is displayed on the user's mobile app. The mobile app provides access to continuous sensor data and thus helps the farmer to take action to meet the needs of the land.

II LITERATURE SURVEY

Many research papers suggest that information needs to be collected from various sensors for live monitoring. The author aims to increase crop yields using a variety of techniques. It also provides a cost-effective WSN for getting data from moisture sensors, soil moisture sensors, and temperature sensors. An automatic system for better farm production. The author proposed a methodology for intelligently collecting data and also propose an intelligent irrigation system. In the proposed model, various sensors are connected to the Raspberry Pi to create an efficient wireless sensor network.

It aims to enable efficient monitoring of the environment to help farmers engage in smart farming to improve overall yields and product quality. The farming sticks proposed are integrated with Arduino technology, a breadboard that connects to a variety of sensors and provides live data feeds

online from Thingspeak.com. According to the authors live agricultural sticks tested on live farmland to provide 98% accurate data. This system undertakes tasks such as soil moisture detection. This also shows the water level, is recognized in the field, and performs automation functions manually switch on / off of electric motor.

In this project, the sensor is interface with the NodeMCU and the android app. The real time data from the sensors will displayed in the user’s android app (Blynk). Android apps are provide continuous access to data from sensors which help farmers take action to meet their soil needs accordingly. Conforming to the soil moisture content the pump will turned ON and OFF automatically through relay. Rain Drop Sensor will used as an smart irrigation system. This system will also detects the ambient temperature as well as determine any motion activity in the farm.

III DESCRIPTION OF THE COMPONENTS

The system contains four sensors - Soil Moisture Sensor, Rain Drop Sensor, IR Motion Sensor, Temperature Sensor. An ESP8266 WIFI Module, Relay and Water Pump. The readings from the sensor are displayed in the Arduino IDE software and is notified in in form of message in IoT based cloud app on Mobile.

ESP8266 (WI-FI MODULE)

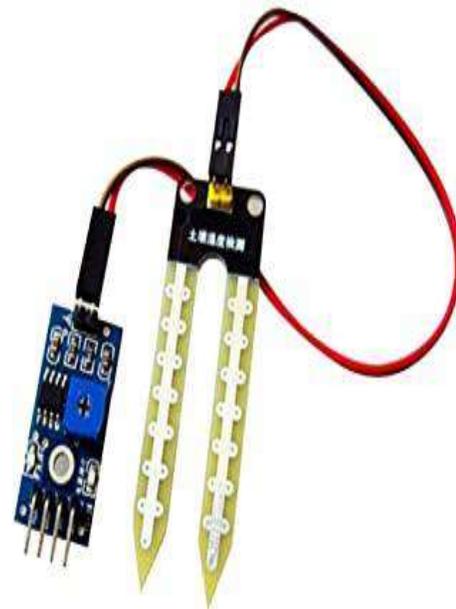
The ESP8266 is a WiFi chip, microcontroller-capable, and a full TCP/IP stack. This module allows the microcontroller to connect WiFi network and do simple TCP/IP connect using Hayesstyle commands. It is open source software and development kit for creating IoT products. It includes firmware running on ESP8266 WiFiSoC and hardware with ESP12 module. Analogue kit (A0). This too there are digital pins (D0D8) on the board. It even supports serial port communications such as SPI, UART, I2C, etc.



There are 17 GPIO pins that are for general purpose input output functions with transmitter and receiver pins. All the sensors are attached to different analog and digital pins of this microcontroller to acquire the data.

SOIL MOISTURE SENSOR

The soil moisture sensor indirectly measures volumetric water content using several other properties of soil, such as electrical resistivity, permittivity, and interaction with neutrons as a substitute for water content. The humidity sensor has three pins. One is for voltage input, the second is for ground, and the third is for analog input. The moisture content (% by volume) of the soil is measured by this sensor. Moisture content is assessed as a percentage, so analog values should be displayed in the range 0-100. The characteristic used by this sensor is the electrical resistance of the soil.



This sensor has two probes that allow current to flow through the ground. When the ground is dry, the ground conducts poorly and resistance increases. Therefore, it uses resistance properties to measure soil moisture . The more water the soil contains, the higher the conductivity and the lower the resistance. Low water content in the soil means low conductivity and high resistance.

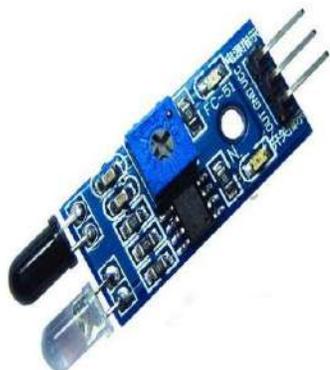
RAIN DROP SENSOR

The raindrop sensor is a rain detection tool. It consist of two modules: a rainbow that detects rain that compares analog values and converts them to digital values. In the appearance of raindrops, water is a conductor, and the appearance of water connects nickel wires in parallel, reducing resistance and the voltage drop across it. The main purpose of the rain sensor is to detect natural rain and save water by turning off the sprinkler. When it rains enough, the irrigation and sprinkler systems will automatically shut down. This reduces wasted water. Also in agriculture and home automation systems for rain detection.



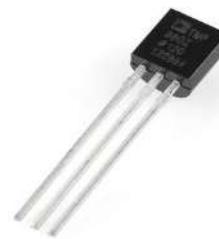
IR SENSOR

Infrared (IR) sensors are electronic devices that measure and detect infrared rays in the environment. As the object approaches the sensor, the infrared light from the LED is reflected by the object and detected by the receiver. The sensor provides both digital and analog outputs. Onboard LEDs are used to indicate this The existence of an object. IR LEDs (emitters) emit IR light that is reflected by an object. The reflected light is received by the IR receiver (photodiode).



TEMPERATURE SENSOR

The LM35 is accuracy integrated circuit temperature sensor whose output voltage is directly proportional to the temperature in degrees Celsius. Therefore, the LM35 is superior to the Kelvin calibrated linear temperature sensor in that the user does not have to subtract a large voltage from the output for practical scaling in degrees Celsius. This sensor is used to determine the ambient sensor.



RELAY MODULE

The relay module is an electric switch which consist of a series of single or multiple input connectors. A control signal and a series of operable contact terminals. The switch can contain any number of contacts. With several contact forms such as closers, openers, combinations, etc. A relay module is an electromechanical device that uses electric current to open and close contacts switch. Single channel relay modules are more than just relays. A component that facilitates switching and connecting and acts as an indicator of the presence of a module. Turn on the switch to see if the relay is active.

WATER PUMP

It is a micro submersible pump which fits on dc 3-6v with price green and portable. It is capable of take round a



hundred and twenty liters for each hour with extraordinarily low cutting-edge utilization. Water degree must be better as though the motor is used with out water, it could damage the components of this tool because of overheating. There are many programs which includes managed fountain water flow, hydroponic systems, managed lawn watering system.

IV SOFTWARE REQUIREMENTS

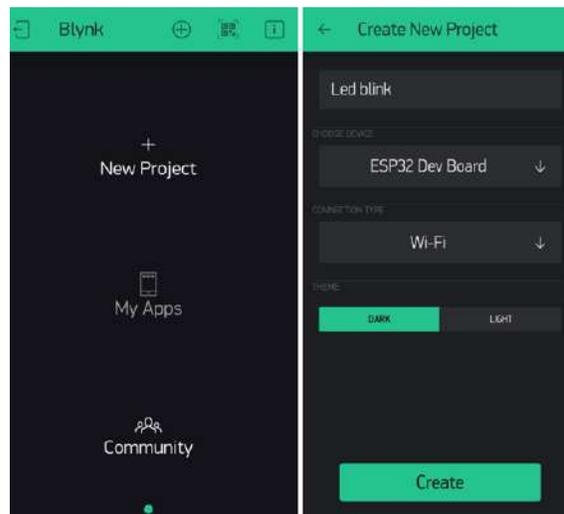
ARDUINO IDE

The Arduino Integrated Development Environment (IDE) is a Linux collection of skylight flow platforms, desktop computer spreadsheet programs for champion movements, and C and C ++ features. It is used to address and send the list to ancillary programs to arduino-enabled boards, but to entail the useful capital of custom brokers for other employer-generated boards. The IDE environment specifically contains the debug part. The old editor and compiler space is used to report deviant rules and later to assemble society and upload it to potential parts of the Arduino. This environment is useful for merging C and C ++ idioms. Arduino IDE is the start of an open origin and is primarily used to process and merge Arduino habits. This is a well-planned operating system program that develops a smooth set of standard features for known to perform the understanding process. This computer program can be quickly accessed from all operating systems such as MAC, Windows and Linux. Arduino Mega, Arduino Uno, Arduino Leonardo, etc. can be types of Arduino modules. Basically, there is a document processor used by the article company, a topic responsibility called location, and a toolbar with buttons for some common features. Sketches are selected due to the permitting program is registered in the customs associated with this program. The coding of this computer program specifically uses the features of c / c ++.

The image above shows a sketched image of an Arduino. The toolbar is made up of many icons. The first icon from the left is for confirmation, the second is for uploading, the third is for opening a new project, the fourth is for opening a project, and the fifth is for saving a project. The icon on the far right opens the serial monitor. The white area in the center is the coding area.

BLYNK APP

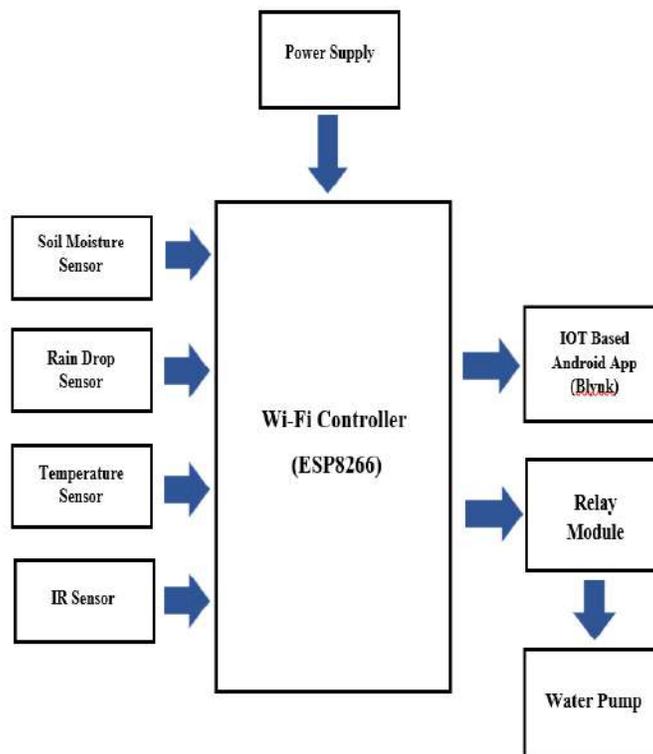
Developed for IoT. The app can also remotely manage the hardware and display sensor information. The app also allows you to imagine and save your data. The platform consists of three key elements: Blynk App You can use some widgets to create a premium accountability interface. Blynk server establish a communication network between the mobile phone and the hardware. Blynk library all incoming and outgoing commands are processed and communication between the server and the process is also possible. Supported hardware and devices have similar APIs and UIs. Connect to the server when using WIFI, Bluetooth, GSM, USB. Operate the pin directly without writing a code. You can easily integrate the functions by using the virtual pins of this app. The Bridge widget allows you to communicate miles between devices.



V WORKING PRINCIPLE

5.1 BLOCK DIAGRAM

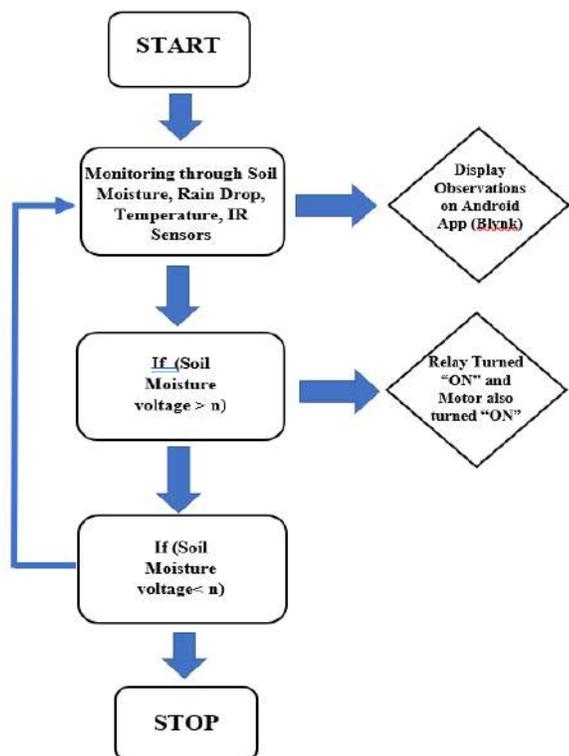
The basic components of an IoT system are sensors, processors, and applications. Therefore, the given block diagram is a proposed model of the project showing the connections between these blocks. The sensor is interfaced to a microcontroller and the data from the sensor is display in the user's mobile app (Blynk). Android app provide continuous access to data from sensors and help farmers take action to meet their soil needs accordingly. In accordance with the soil moisture content the pump will turned ON and OFF.



5.2 WORKING

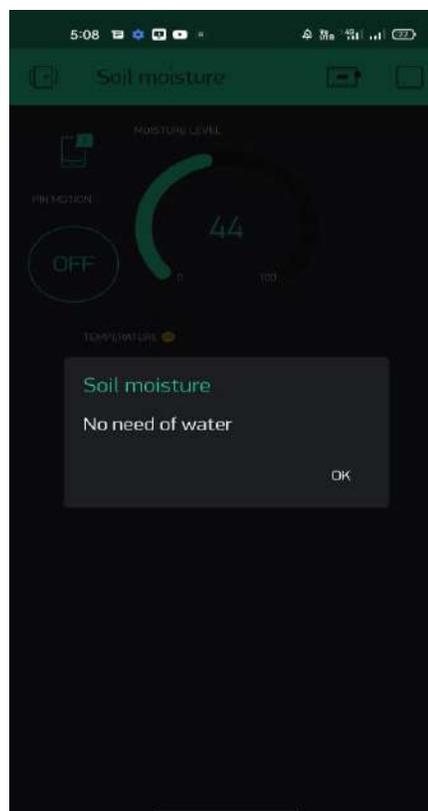
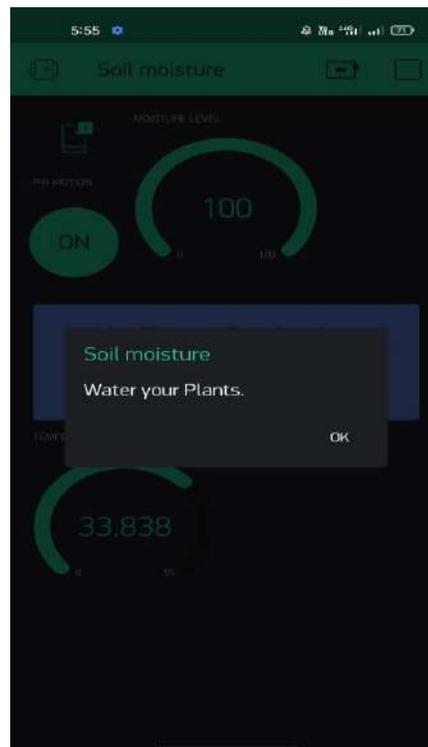
In this Smart Agriculture System, the setup contains Microcontroller that is NodeMCU then sensors they are Soil Moisture, Rain Drop Sensor, IR sensor, Temperature Sensor, and Water Pump which is connected through relay module. In this NodeMCU gives base for live streaming of temperature, soil moisture, rain drops, light intensity and sending the sensor information to the server using ESP8266 WIFI module and also the data of these sensors are sent to the Android App (Blynk App). The Soil Moisture sensor used to determine moisture content present in the soil and notify us whether the water required or not. When the soil is dried (soil moisture voltage is high), then the relay module will turned ON and hence the relay module is on the water pump will turned "ON" automatically. And when the soil is moist (soil moisture voltage is low), then the relay module will turned "OFF" hence the pump will turned "OFF". The Rain Drop Sensor will used as an automatic irrigation system that causes the system to shut down in the event of rainfall. When raindrops fall on the sensor board and then the message "It's Raining" will display on the LCD screen of the android app. IR sensors are designed to detect any movement activity (any human or animal entering the farm). The sensor value is read by the Node MCU and displays "Motion detected!". Message from Android app (Blynk app). A temperature sensor will measures the ambient temperature.

5.3 FLOWCHART



5.4 RESULTS

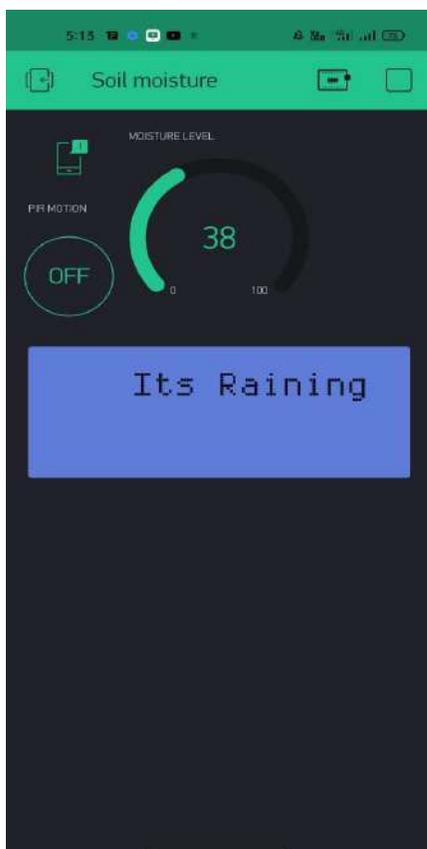
The fig below shows whether water is required or Not by determining moisture content of the soil using soil moisture sensor. This is on Blynk App.



The fig. below shows the Motion is determined by the IR Sensor.



This fig. shows results shown by Rain Drop Sensor on LCD Screen. This is on Blunk App.



The Fig. below shows the results, detected by the temperature sensor. This is on Blynk App.



6. CONCLUSIONS

Therefore, in this project, we observed many parameters such as moisture of the soil, rain intensity, ambient temperature, and farm activity. This will encourage farmers to use upgrade techniques. This system has high efficiency and accuracy in acquiring data on the moisture and temperature of living soil. The system proposed in this report allows farmers to obtain accurate live food for ambient temperature and soil moisture, accurate results, allowing farmers to increase agricultural yields and produce food efficiently. This framework produces estimates of soil parameters based on the continuous information collected from the fields and the information from the climate memory. Using the sensor, the crop field was connected to the internet.

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We would like to thank Prof. Mrs. Snehal Koparde Ma'am, our mentor, for believing in us and guiding us through the Smart Agriculture System Based on IoT project, which encouraged us to complete it successfully. Working on this project provided us with a wealth of knowledge. We are sincerely thankful for our mentor for giving us this golden opportunity, guidance and all time support.

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