Automatic Entry System With Temperature And Mask Scanner For Reducing Covid-19 Transmission

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Abstract- *The corona virus disease, or COVID-19, which originated primarily in Wuhan, China, has rapidly spread to several countries, including India. Using Face masks and sanitizers are the most effective ways to minimize transmission which, reduces the viral infection through air and has shown good results. The virus can attack directly by respiratory droplets. The Government implemented a variety of protection and safety initiatives to reduce disease transmission. Hence wearing facial mask is essential to reduce the transmission of virus in public places such as Malls, Workplaces, Temples and Hospitals. Hence embedded device is designed to monitor the people entering in public places. The proposed system is a Smart Entry device which uses Arduino Microcontroller interfaced with temperature sensor that monitors human body temperature and Image Processing method is used to detect the facemask. This device kept at the entrance of the respective places will automatically detect the temperature and status of face mask and access to entry at the gate is decided along with the voice message. The system when implemented is found to be efficient and cost effective.*

Keywords- Arduino, LCD, Servo Motor, Temperature Sensor, Webcam

I. INTRODUCTION

The first step is to detect Covid-19 by scanning for fever. Then, monitor every person for a mask. In existing system manual temperature scanning process is done, through which social distance cannot be maintained which causes infections. The person who maintain the checking process forfever are not well trained on using temperature scanner devices. There is human error in reading values. To solve this problem, the proposed system consists of a fully automated temperature scanner, mask scanner and entry provider system. The system used an contactless temperature for scanner and a mask monitor. The scanner is connected directly with a relay that connected to human barrier which controls the access to the entrance gate/barrier by servo motor. Entry is restricted to persons with high body temperature and without mask. Only the person who having both conditions succeed is allowed inside the place.

II. LITERATURE SURVEY

Adrian Florea and Lucian Blaga proposed an embedded system to identify possible COVID-19 suspects using thermos vision cameras. It is developed a real time temperature screening process and capable of sending alarm signals to authorized person. once the temperature is high that are sending alarm signals over network or SMS. This system will detect the age, the gender, the facial emotion, and whether the subject is wearing mask or not. However, this system having the disadvantage of using thermal camera and a phone camera, it does not show the proper image. This system can't identify whether it is object standing in a light/shadow.

Krishnanaadashet designed a CNN (Convolutional Neural Network) Based COVID-19 Prevention system. In this proposed system, Artificial intelligent (IOT system) with temperature monitoring, auto sanitization and mask detection . In this system, the machine which is used that connected to a server by which the admin person can monitor everything live from anywhere. The system also has features of face recognize and admin can maintain the proper database with temperature, auto sanitization system for door opening and closing system. The drawbacks of this system is not properly protected. Here also for monitoring always admin is needed. Only auto sanitization system for door opening and closing is not applicable to control the COVID

Ibrahim, Mohammed proposed a Cloud-based COVID-19 patient Monitoring using Arduino. This System is used to measure the body temperature, blood oxygen level which connects to a Micro Processor (ATmega)And the details will be stored to the cloud server and this system gives a alert to the doctors. The disadvantages of this system isthe devices should be attached to their body 24/7.The patient can also Monitor this , So this can cause them to fear. It doesn't show the Accuracy, percentage of the temperature.

Prachi Chauhan proposed the Face Mask Detection Classifier and Model Pruning with Keras –Surgeon. This is result-based approach & used to help scan, assess, predict and track Current patients and possibly potential patients. Developments for tracking social distances of recognizing face masks have made headlines in particular. Our goal is to train a customized deep learning model that helps to detect whether the person wearing the mask or not. Includes huge storage requirements, Vulnerable detection and potential privacy issues. Complexity of different machine learning algorithms for the purpose of security authentication and surveillance.

Torikul, Sourav proposed the Low-Cost Smart COVID-19 Patient Monitoring and Support System. This system is to solve the COVID-19 pandemic situation accentuates a faces on remote patient monitoring. A Small Smart health Care Support system is built to monitor COVID-19 patient health status. This system can also trace the patient location, thus aid can be provided to the patient promptly. Drawbacks is remote patient Monitoring requires New practice software, with Remote patient. Monitoring provides reap a profound amount of data for each patient. Data reliability can be affected with improper use. Remote patient monitoring is reducing readmission rates

III. METHODOLOGY

The Arduino Microcontroller is the heart of the system to which face mask scanner and temperatures canner is interfaced. The power supply unit is added to the Microcontroller.

1) FACIALMASK SCANNER

The detection of a facial mask is split into two parts. The preparation and the mask detection code. A data set for facial masks can be generated by taking a series of masked and mask-less photographs, and identifying the region of interest in the face area, eyes lips,jaw lines, ears etc. And this can be done in Python script for OpenCV (computer vision). If the data is loaded successfully, Keras and Tensor Flow are used to exert the face mask classifier. The facemask classification is standardized to the disc. The forecast is printed on the panel, showing the area of concern in a green boundary box while the mask is worn and in a red boundary if the mask is not worn. If the mask is not worn, the echo from the buzzer can also be heard and status is displayed in the LCD display.

2) TEMPERATUREDETECTION

For the detection of the body temperature, here we use DHT11 is a integrated circuit temperature sensor for the detection of accurate value of human temperature Here we need to draw some limit to it. If it crosses the cut off limit then the buzzer and indicator will goon. Based on the above conditions are satisfied the barrier will be operated automatically
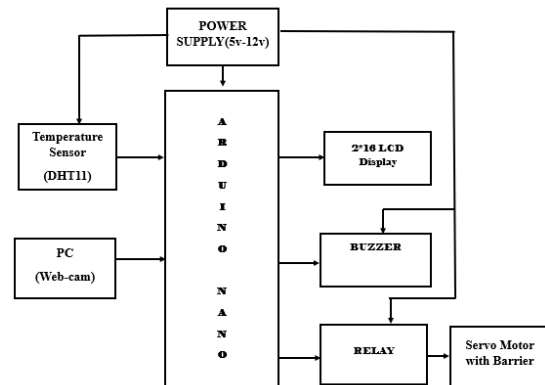

Fig.1 Block Diagram

IV. HARDWARE DESCRIPTION

1) **ARDUINO NANO**

Arduino Nano is a low budget microcontroller board. While associating microcontroller board with computer we use USB cables, it has 15 digit input pins and 15digit output pins. With the help of the board, we can make lot of connection between electronics devices. It used as easy programming and synchronizing of different analog sensors and digital sensors and it is capable of sending and receiving data over the internet and the cable . The Arduino Nano operating voltage of the board is 5volt. The board is able to read inputs and turn them into output, it light on a sensor, activate a motor, and turning on LED.
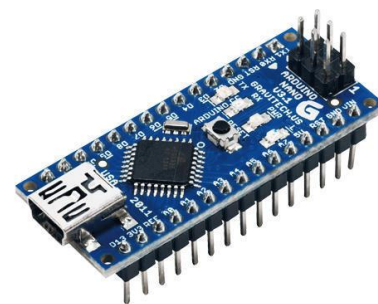

Fig.2 Arduino Board

2) **TEMPERATURE SENSOR**

The DHT11 is a basic temperature sensor, ultra low-cost temperature and humidity sensor. It used to measure temperature more accurately than the thermistor .Thermistor measure the surrounding air and spits out digital signal on the data pin (no analog input pins needed and it is capacitive humidity sensor It's fairly very simple to use but requires accurate careful timing to grab data.
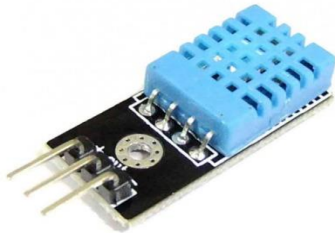

Fig3. Temperature sensor(DHT11)

3) CAMERA

The camera is used to scan the faces checking whether the person is wearing the mask or not and sends an alert after detection of the mask. A user-friendly website allows us to see who is not wearing the mask and the camera captures the photo or video.

Fig4. Camera

4) LCD DISPLAY

A 2*16 LCD means it can display 2rows and 16columns. In this LCD each character is displayed in5*7pixel matrix. The 2*16 intelligent alphanumeric dot matrix display is capable of displaying 224 different characters and symbols. This LCD used to display the results of conditions.

Fig.5 LCD Display

5) SERVO METER

A servo motor is one of the type of motor that can rotate with great precision. Normally, this kind of motor consists of a control circuit that gives feedback on the current position of the motor shaft, this feedback allows the servo motors to rotate with great precision. If you want to rotate an any object at specific angles or distance, then you can use servo motor. It's just made up of a simple motor which runs by an servo mechanism. The motor which is operator by a DC power supply then it is called DC servo motor, and if the motor is operator by a AC then it is called AC servo motor. Normally, Servo motors units are kilogram per centimeter(kg/cm)most of the servo motors are rated at 3 or 6or 12kg/cm.

Fig.6 Servo Meter

6) RELAY

The 5 volt relay module is a type of relay module that requires a 5V DCinput to operate. But that's not all there's to it. Here's more, including the specifications. A 5V relay module is a single or multi-channel relay module that works with a low- level trigger voltage of 5V DC. The input voltage can be from any microcontroller or logic chip that outputs a digital signal. Like most other relays, the 5V relay module is an electrically operated, electromagnetic switch that can be

used to turn on or turn off a circuit. It consists of two parts: the relay itself and the control module.

Fig.7 Relay

7) **POWER SUPPLY**

This power supply is used to give source to the required electronic components. It provides 2voltages (i. e) 5volts and 12volts and we provide the voltage based on the needed power. The main function is to convert the alternating current into direct current.

Fig.8 Power Supply

V. SOFTWARE DESCRIPTION

It is an Integrated Development Environment(IDE). It is software application that helps programmers to develop the software code efficiently. It increase developer productivity by combining capabilities such as software editing, building, testing, and packaging in an ease-to-easy use application.
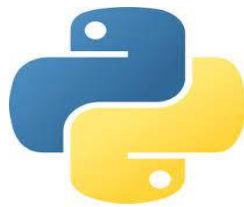

Fig.9 Python IDE

VI VERIFICATION AND RESULTS

The main aim of our project is to prevent the spreading of COVID among the people and this entry system provides entry automatically. It will remind the person whether the individual has COVID or not. If the individual has a high temperature, the entry system provides the buzzer sound with the help of the buzzer and they will go to the hospital which is present inside the university. If the individual does not wear a mask, the entry provider system will insist on him to wear a mask with sound and along with voice message. If the individual has a normal temperature and worn a mask, then he will be allowed inside the university
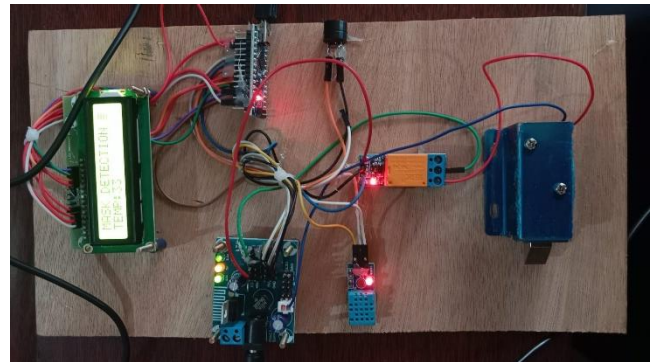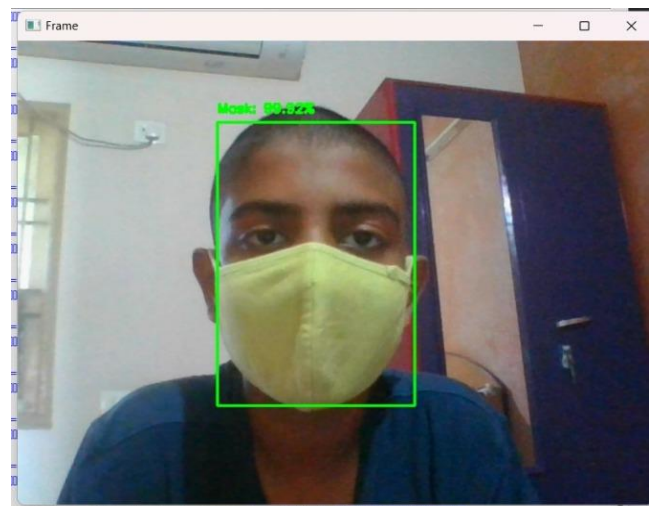

Fig.10HardwarePrototype

Fig.11 LCD Display Output for Mask Detection

VII. CONCLUSION AND FUTURE ENHANCEMENT

During this Covid-19 pandemic situation, precautionary measures should be taken to reduce the spreading of the corona virus. The proposed system is designed to detect the high temperature and mask scanning without human intervention, which highly reduces spread of Covid-19 infections. This smart device is designed using an Arduino microcontroller which controls the whole system. This project is based on the automatic scan mask and scanning the Temperature of the body. In addition of this proposed Method we can include voice recognition and it can also detects the long distance mask.

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