Sapna Gangrade[1] , Mohammed Abdul Muqeem[2] , Seesala Sowmya[3] , M.F Danish[4] , Mohd Saif Adeem[5]

Research Article

IOT BASED AUTO TEMPERATURE SCAN ENTRY SYSTEM WITH MASK DETECTION AUTOMATIC HAND SANITIZER FOR COVID PREVENTION AT LARGE SCALE

Sapna Gangrade[1] , Mohammed Abdul Muqeem[2] , Seesala Sowmya[3] , M.F Danish[4] , Mohd Saif Adeem[5]

ABSTRACT

The first step to detect COVID is by scanning for fever. Also we need to monitor every person for a mask. We have temperature checking systems for every entrance for scanning but manual temperature scanning has a lot of disadvantages.

The personnel are not well trained on using temperature scanner devices. There is human error in reading values. Many times people are not barred from entry even after higher temperature readings or no masks. The scanning is skipped by the personnel if supervisors are not watching. Manual scanning system is not suitable for large crowds. To solve this problem we here propose a fully automated temperature scanner and entry provider system. It is a multipurpose system that has a wide range of applications. The system makes use of a contactless temperature scanner and a mask monitor. The scanner is connected directly with a human barrier to bar entry if high temperature or no mask is detected.

KEYWORDS: Raspberry Pi, open CV, python, camera and LCD, covid 19, HDMI/DVI, temperature sensor, lOT.

I.INTRODUCTION

The purpose of the project is to detect the person perfectly wearing mask or not and temperature detection of the person if the both are correct then the door allows the person in and there will be automatic
sanitization these consists of temperature sensor, raspberry Pi model 3b also we are using a IOT based technology to store the data and some other components like buzzer, motor, lcd.
Having both conditions is instantly allowed inside. The system uses a temperature sensor and camera connected with a raspberry pi system to control the entire operation. The camera is used to scan for masks and temperature sensors for forehead temperature. The raspberry processes the sensor inputs and decides whether the person is to be allowed. In this case the system operates a motor to open the barrier allowing the person to enter the premises**.** If a person is flagged by the

[1] ASSISTANT PROFESSOR, DEPT OF ECE. LORDS INSTITUTE OF ENGINEERING AND TECHNOLOGY, HYDERABAD

2,3,4,5 B. TECH Students, Department of Electronics and Communication Engineering LORDS INSTITUTE OF ENGINEERING AND TECHNOLOGY, HYDERABAD

system for high temperature or no Mask the system glows the red light and bars the person from entry. Also the face and temperature of a person is transmitted over IOT to the server for authorities to take action and test the person for covid.

Thus the system provides a 100% automated system to prevent the spread of COVID.

Raspberry Pi display and connectivity cable any HDMI/DVI monitor and any TV should work as display for the pi. For the best results, we used one with HDMI input, but other connections are available for older devices. Keyboard and mouse will work any standard USB keyboard with our raspberry pi SD card. We recommend an 8GB class 4 SD card, ideally pre installed with NOOBS. We all need a good power supply which can supply at least 2A at 5V for the model 3b Pi.
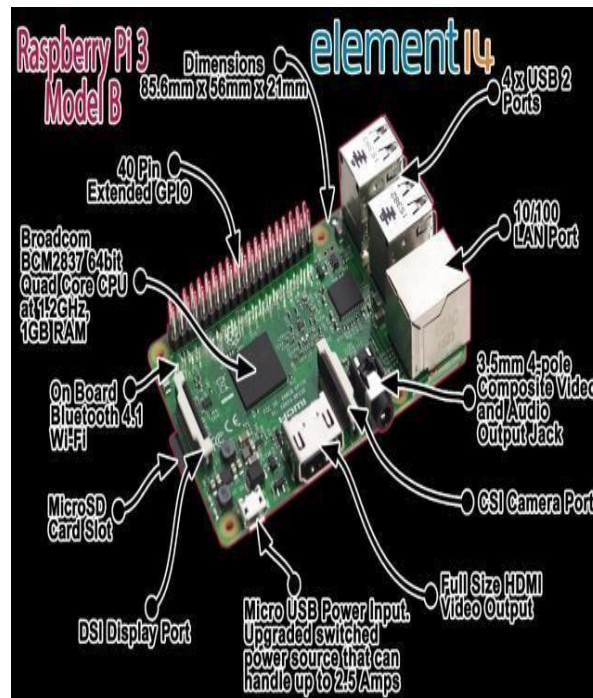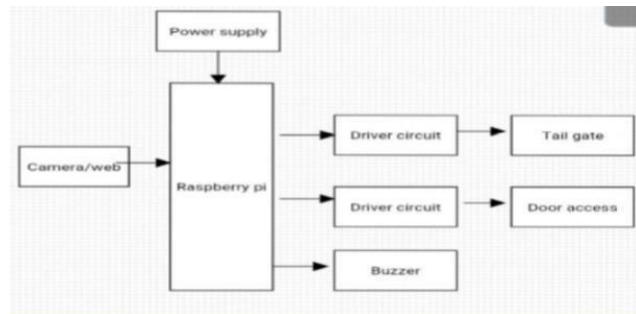
II.INTERNET OF THINGS (IOT)

IOT is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction. "A complete IoT system integrates four distinct components: sensors/devices, connectivity, data processing, and a

Sapna Gangrade[1] , Mohammed Abdul Muqeem[2] , Seesala Sowmya[3] , M.F Danish[4] , Mohd Saif Adeem[5]

user interface. Below I will briefly explain each component and what it does.Once the data gets to the cloud, software performs some kind of processing on it.

This could be very simple, such as checking that the temperature reading is within an acceptable range. Or it could also be very complex, such as using computer vision on video to identify objects (such as intruders in your house).But what happens when the temperature is too high or if there is an intruder in your house?
That's where the user comes in.

III. DESCRIPTION OF EXISTING MODEL

This model consists of raspberry pi and temperature sensor, interfacing circuit, camera, buzzer, LCD display, driver circuit, Door access and a sanitizer motor.

In the existing model there is only mask detection which detects the face of the person wearing mask or not on this proposed model we have used the
Fig: Block diagram of Existing model

Temperature sensor and the automatic Sanitization the model.

IV. DESCRIPTION OF PROPOSED MODEL

The LM35 is an integrated circuit sensor that can be used to measure temperature with an electrical output proportional to the temperature (in oC) The LM35 – An Integrated Circuit Temperature Sensor.

Why Use LM35s to Measure Temperature or can measure temperature more accurately than using a thermistor. The sensor circuitry is sealed and not subject to oxidation, etc. The LM35 generates a higher output voltage than thermocouples and may not re
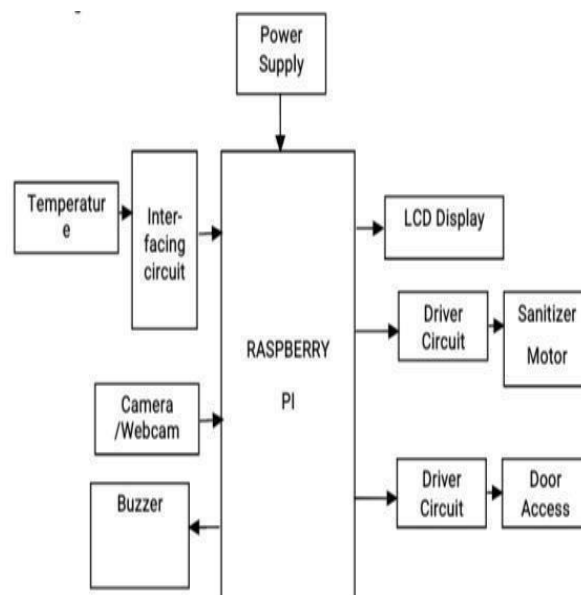

Fig: Block diagram of proposed model

Require that the output voltage be amplified. It has an output voltage that is proportional to the Celsius temperature. The scale factors of the components.
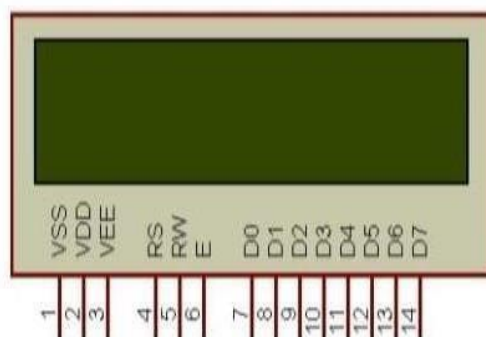
A buzzer or beeper is an audio signaling device, which maybe mechanical, electromechanical, piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke. Early devices were based on an electromechanical system identical to an electric bell without the metal gong. Similarly, a relay may be connected to interrupt its own actuating current, causing the contacts to buzz. Often these units were anchored to a wall or ceiling to use it as a sounding board. The word "buzzer" comes from the rasping noise that electromechanical buzzers made.
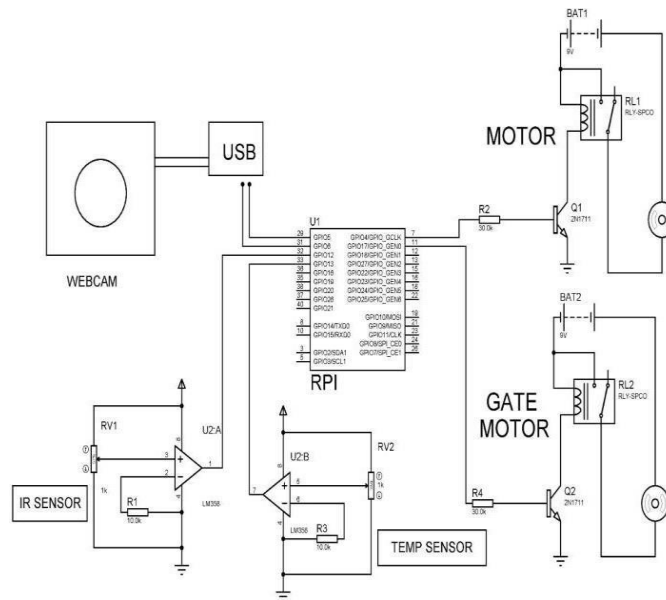
Fig: Schematic Diagram of the proposed system.

V. HARDWARE DESCRIPTION

The most commonly used character based LCD'S are based on Hitachi's HD44780 controller or other which are compatible with HD44580. The most commonly used LCDs found in the market today are 1 line, 2 line or 4 line LCD supporting more than 80 characters, whereas LCD's supporting more than 80 characters make use of 2 HD 44780 Controllers.

Sapna Gangrade[1] , Mohammed Abdul Muqeem[2] , Seesala Sowmya[3] , M.F Danish[4] , Mohd Saif Adeem[5]

Fig: LCD Display.

The LM35 does not require any external calibration or trimming and maintains an accuracy of +/- 0.4 oC at room temperature and +/- 0.8 oC over a range of 0 oC to +100 oC. Another important characteristic of the LM35DZ is that it draws only 60 microamps from its supply and possesses a low self-heating capability. The sensor self-heating causes less than 0.1 oC temperature.

Fig: Temperature Sensor.

An amplifier can either be a separate piece of equipment or an electrical circuit contained within another device. Amplification is fundamental to modern electronics, and amplifiers are widely used in almost all electronic equipment. Amplifiers can be categorized in different ways. One is by the frequency of the electronic signal being amplified. For example, audio amplifiers amplify signals in the audio (sound) Range of less than 20 kHz, RF amplifiers amplify frequencies in the radio frequency range between 20 kHz and 300 GHz, and servo amplifiers and instrumentation amplifiers may work with very low frequencies down to direct current. Amplifiers can also be categorized by their physical placement in the signal chain; a preamplifier may precede other signal processing stages, for example.

Fig: Buzzer

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 the user to see who is not wearing the mask and the camera captures the photo or video.


Fig: Webcam

VI.SOFTWARE DESCRIPTION

Python

The Raspberry pi b3 model uses programming based on python. Python is a general purpose programming language that can be used for a variety of applications. It includes high-level data structures, dynamic typing, dynamic binding, and many more features that make it as useful for complex application development as it is for scripting that connects components together. It is also extended to make system calls to almost all operating systems and to run code.

Even though this project in Python is of low complexity, it will expose you to real-world Machine Learning simulation, in a fun way. In addition, you will get to import and explore a dataset to fit your requirement, pre-process it to remove noise, implement the model using SKLearn , train it on the training dataset, and finally test it on the test dataset.
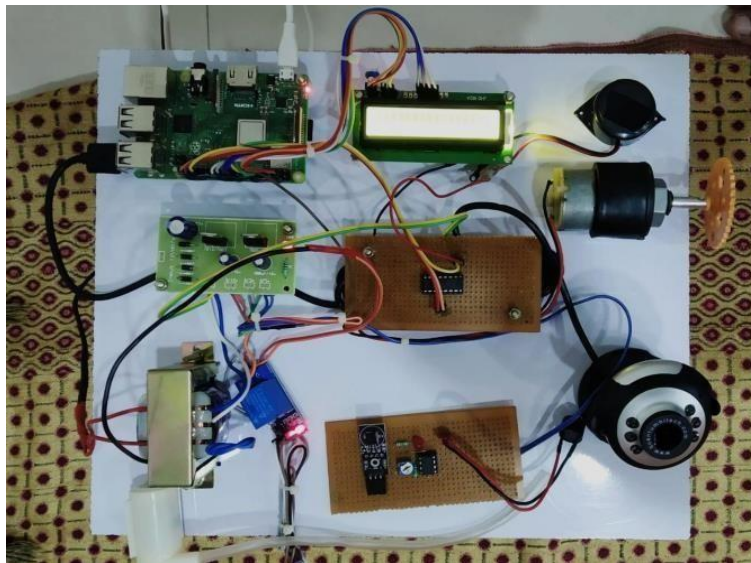
OpenCV

For the purpose of the images being captured on the camera we use the algorithm from the Python OpenCV's (Open Source Computer Vision Library) is an open source computer vision and machine learning software library. The library has more than 2500 optimized algorithms, which includes a comprehensive set of both classic and state-of-the-art computer vision and machine learning algorithms.

These algorithms can be used to detect and recognise faces, identify objects, classify human actions in videos, track camera movements, track moving objects, extract 3D models of objects etc.

Sapna Gangrade[1] , Mohammed Abdul Muqeem[2] , Seesala Sowmya[3] , M.F Danish[4] , Mohd Saif Adeem[5]
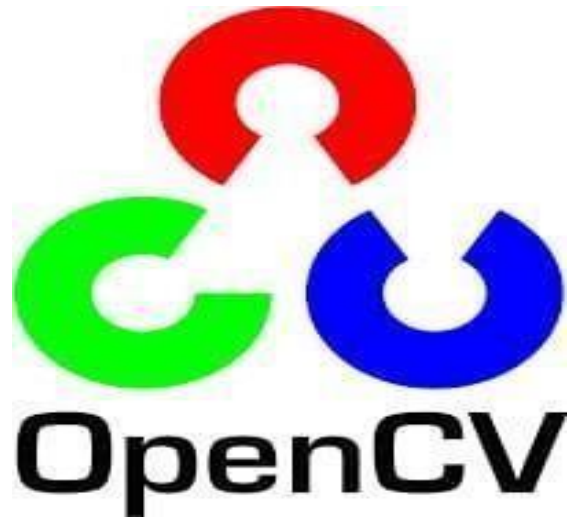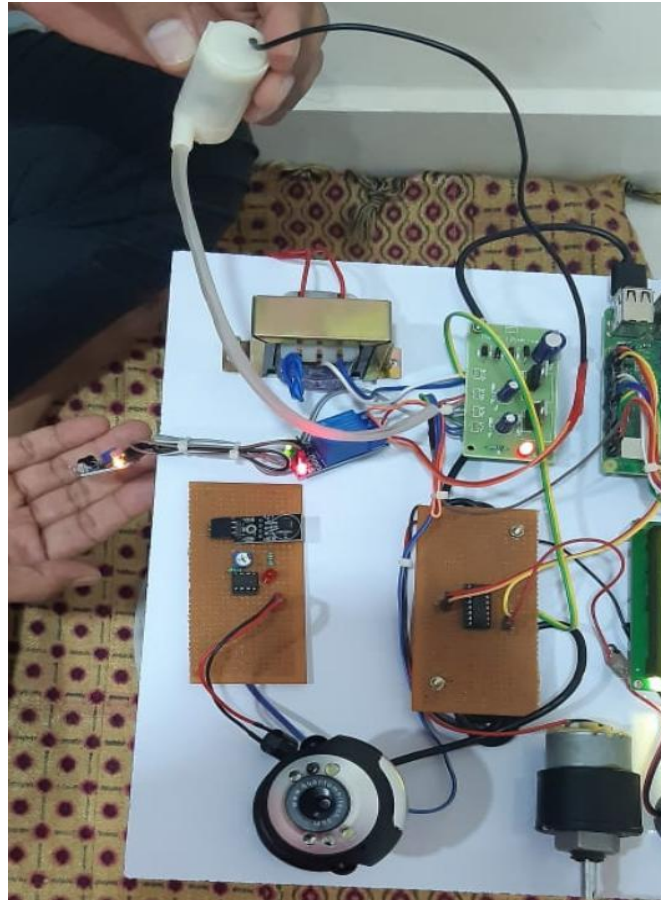

RESULT

Fig: Connection of hardware

After connecting the hardware as per the given instructions and programming the raspberry Pi as per the given flow chart and requirements, we have got the following circuit. The readings were observed as [2] normal. If a person comes near to the camera detects the face with mask will be detected.

Fig:Working model image

VII.CONCLUSION

This paper proposes a fog-cloud combined IOT For COVID-19 prevention and control by implementing five NPIs, including COVID-19 Symptom Diagnosis, We discuss how the recent technological advances like OpenCV's and the python.

REFERENCES

[1] Susanto. E.   Rudiawan.   R. Analia. D. S. Pamungkas. And H. Soebekti. "The deep learning development for real-time ball and goal detection of barelang-FC." In 2017 International Electronics Symposium   on Engineering Technology   and Applications (IES-ETA). Surabaya.   2017. pp.   146-151.   doi: 10.1109/ELECSYM.2017.8240393.
[2] C. Liu. Y. Tao. J. Liang. K. Li and Y. Chen. "Object detection based on the YOLO network." in 2018 IEEE 4th Information Technology and Mechatronics Engineering Conference (ITOEC). Chongqing. China.

Sapna Gangrade[1] , Mohammed Abdul Muqeem[2] , Seesala Sowmya[3] , M.F Danish[4] , Mohd Saif Adeem[5]

2018. pp. 799-803. doi10.1109/ITOEC.2018.8740604.

[3] W. Yang and Z. Jiachun. "Real-time face detection based on YOLO." in 2018 1st IEEE International Conference on Knowledge Innovation and Invention (ICKII). Jeju. 2018. pp. 221-224. doi: 10.1109/ICKII.2018.8569109.

[4] D. Ciarg. P. Cioel. S. Pandya. A. Cianatra and K. Kotecha. "A deep learning approach for face detection using YOLO." in 2018 IEEE Punecon.

Pune. India. 2018. pp. 1-4. doi:

10.1109/PUNECON.2018.8745376.

[5] C. Kim et al., "Implementation of Yolo-v2 image recognition and other testbenches for a CNN accelerator," in 2019 IEEE 9th International Conference on Consumer

Electronics (ICCE-Berlin), Berlin, Germany, 2019, pp. 242-247, doi: 10.1109/ICCE-Berlin47944.2019.8966213.

[6] H. V and K. R, "Real time pedestrian detection using modified YOLO[' '] V2," in 2020 5th International Conference on Communication and

Electronics Systems (ICCES), COIMBATORE, India,

2020, pp. 855-

859, doi: 10.1109/ICCES48766.2020.9138103.

[7] CDC COVID-19 Response Team. Preliminary estimates of the prevalence of selected underlying health conditions among

Patients with coronavirus disease 2019—United States, February 12–March 28, 2020. Morb. Mortal. Wkly. Rep. 2020, 69, 382–386.

[8] CDC COVID-19 Response Team. Severe Outcomes among Patients with Coronavirus Disease 2019 (COVID-19)-United States,

February 12-March 16, 2020. MMWR Morb. Mortal Wkly. Rep. 2020, 69, 343–346.

[9] Moriyama, M.; Hugentobler, W.J.; Iwasaki, A. Seasonality of respiratory viral infections. Annu. Rev. Virol. 2020, 7, 83–101.

[10] Yang, J.; Reuter, T. Three Ways China Is Using Drones to Fight Coronavirus; World Economic Forum: Geneva, Switzerland, 2020;

[11] Gupta, P.; Agrawal, D.; Chhabra, J.; Dhir, P.K. IoT based smart healthcare kit. In Proceedings of the IEEE 2016 International

Conference on Computational Techniques in Information and Communication Technologies (ICCTICT), New Delhi, India, 11–13

March 2016; pp. 237–242.

[12] Dong, E.; Du, H.; Gardner, L. An interactive web-based dashboard to track COVID-19 in real time. Lancet Infect. Dis. 2020,