IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 1, June 2023

IoT Based Temperature Mask Scan Entry Barrier

Komal Randive[1], Kshitija Wagh[2], Shubham Gholap[3], Prof. Vineeta Phillip[4]
Assistant Professor, Department of Electronics and Telecommunication Engineering[4]
Students, Department of Electronics and Telecommunication Engineering[5]
AISSMS Institution of Information and Technology, Pune, India
Savitribai Phule Pune University, Pune, India

Abstract: *IoT-enabled barriers that detect face masks and measure body temperature using machine learning. The suggested model can be applied to any entry, including those to a mall, a hotel, an apartment complex, etc. As a result, a dependable and affordable way for creating a healthy environment utilising AI and sensors.*

Keywords: Raspberrypi, Deep Learning, Prediction, Tensor flow, keras, training process, CNN etc

I. INTRODUCTION

The project's goal is to detect whether a person is wearing a mask correctly and to measure their body temperature; if both are accurate, the door will open and automated sanitization will begin. These are made up of temperature sensors, a Raspberry Pi model 3b, as well as additional parts like a buzzer, motor, and LCD. We also use IOT-based technologies to store the data. Having both requirements immediately grants entry. To regulate every aspect of the system, a raspberry pi computer is coupled to a temperature sensor and camera. Both the presence of masks and the temperature of the forehead can be determined with the help of the camera's builtin temperature sensors. are sent via IOT to a server so that authorities can test them for covid. As a result, the system offers a fully automated system to stop COVID from spreading.

II. LITERATURE REVIEW

2.1 SUMMARY OF LITERATURE SURVEY:

Control and System Graduate Research Colloquium Face Mask Detector using Deep Learning, uses and states that Keras/Tensor Flow, and Open CV Focus on loading this dataset for disc mask detection, using Keras/TensorFlow to train a model on it, then serialising your face mask into the disc.(Adrian Rosebrock,2020 IEEE) After training, the face mask detector is loaded, faces are detected, and each face is classified as having a mask or not. (Lim, M. G., &Chuah, J. H.,2018 2018 9th IEEE Control and System Graduate Research Colloquium (ICSGRC).. Recognition of Durian Types Using CNN and Deep Learning techniques, a successful model based on the properties of durians was created, improving recognition speed and accuracy. During the neural network training process, non-durian photos are used. On perfect bottom-view pictures of Duriozi bethinus, the trained model's prediction accuracy was 82.50 percent. (K Baskaran, Baskaran P., N. Kumaratharan, Rajaram V., The Fourth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC) IEEE Xplore Part Number: CFP20OSV-ART; ISBN: 978-1-7281-5464-0 2021) COVID Preventive System for Work Environment Using IoT" states that A detection technique suggested by is object detection using Hare feature-based cascade classifiers. It is a machine learning-based method, and the cascade function is trained over a large number of both positive and negative images before being applied to the task of identifying objects in additional images. (Smart Door Unlocking System Based on Internet of ThingsUsing Raspberry Pi Meenpal, T, Balakrishnan, A., & Verma, A, 2019 IEEE 2019) Using segmentation, face mask detection The VGG-16 Architecture is used for feature extraction. In order to train Fully Convolutional Networks to semantically separate the faces in the image. A technique for producing accurate face segmentation masks from input images of any size.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 1, June 2023

III. AIM AND OBJECTIVES

3.1 Aim

The pandemic was caused by the global health disaster that was COVID 19. The most efficient preventative method involves always and everywhere wearing a face mask in public settings. In reaction to the COVID 19 outbreak, governments all over the world were compelled to implement lockdowns in order to prevent the further spread of the virus. The results of a poll indicate that donning a face mask when in public places significantly reduces the likelihood of becoming infected with an infectious disease. The primary objective of this project is to develop an Internet of Things (IoT)-enabled smart door that is able to recognise face masks and monitor body temperature. The suggested model is adaptable to any entrance, be it to a shopping centre, a hotel, an apartment complex, or any other type of building. As a consequence of this, a trustworthy and inexpensive method for establishing a healthy atmosphere through the utilisation of AI and sensors. 1. Staff members lack adequate training in the use of temperature scanners. 2. Oftentimes, even with higher temperature readings or without masks, people are not denied admittance. 3. If supervisors are not present, staff members will not scan. 4.Manual scanning systems are ineffective in densely populated areas.

3.2 Objectives

The first step in the COVID detection method is to determine whether or not the individual has a fever. In addition to that, we have to look everyone over for masks. At each and every entrance is a temperature monitoring and scanning system, despite the fact that manually verifying the temperature has many problems. The employees have not received sufficient training in the proper usage of the temperature scanning devices. When reading values, there is room for inaccuracy due to human intervention. People are typically permitted to enter the building even when the temperature readings are higher than normal or when there are no masks available. Staff members will not scan if there are no supervisors available to oversee them. The use of manual scanning methods is not appropriate for large crowds. As a solution to this problem, we present a system that is fully automated and functions as a temperature scanner as well as an entry provider. It is a flexible system that can be utilised in a wide variety of contexts. A mask monitor and a contactless temperature reader are utilised in the technique. A human barrier is instantly attached to the scanner in order to deny access in the event that a high temperature or the absence of a mask is discovered. As a solution to the problem statement presented, we propose using a system that is both fully automated and a temperature scanner and entry provider. It is a versatile system that may be applied in a wide variety of contexts. A mask monitor and a contactless temperature reader are utilised in the technique. A human barrier is instantly attached to the scanner in order to deny access in the event that a high temperature or the absence of a mask is discovered.

1. To aid with contactless sanitation in public areas.
2. To avoid viral infection.
3. To develop a new hygiene system and put it into action

3.3 Methodology

Algorithm for Convolutional Neural Networks

Convolution Neural Networks (CNN) classification and face mask recognition are both done in this research using a deep learning technique. Each layer of a CNN applies to a distinct set of filters, and it is mostly used for image analysis and recognition. A CNN is a type of artificial neural network that is specifically designed to understand pixel input. A final result is produced by combining between 100 and 1000 filters, and the output is then forwarded to the neural network's next layer. By employing the TensorFlow software library and the face mask detection algorithm, the suggested framework is evaluated. Keras and TensorFlow are used to train the Mask detection model. The following lists the steps that make up the algorithm.

3.4 Specifications of the System

The high-level breakdown of the connecting structures that make up the solution. Anybody trying to enter the facility must first pass through infrared sensors that keep track of and regulate the precise number of persons entering and leaving each room. Only when there are fewer people inside a room than the specified maximum is body temperature

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 1, June 2023

checked. For this, a body temperature sensor called the MLX90614 is employed. The door won't open if the person's body temperature is too high; if it's normal, the door will open and move on to the next stage, which is mask detection. This task is performed with a Raspberry Pi single-board computer equipped with a Raspberry Pi Camera. The door will be opened if a mask-wearing person is seen. The door won't open if the person is seen without a mask. This IoT solution is put into use at COVID-19 to guarantee the rules and safety for indoor workers.

IV. BLOCK DIAGRAM OF THE SYSTEM AND ITS EXPLANATION

This model includes a Raspberry Pi, a temperature sensor, a door access system, an interface circuit, a camera, a buzzer, an LCD display, a driving circuit, and a sanitising motor. The LM35 is an integrated circuit temperature sensor that may be used to monitor temperature and generate an electrical output proportional to the temperature (in oC). A buzzer or beeper is a mechanical, electromechanical, or piezoelectric audio signalling device. Buzzers and beepers are frequently used as alarm clocks, timers, and to validate human input such a mouse click or keyboard.

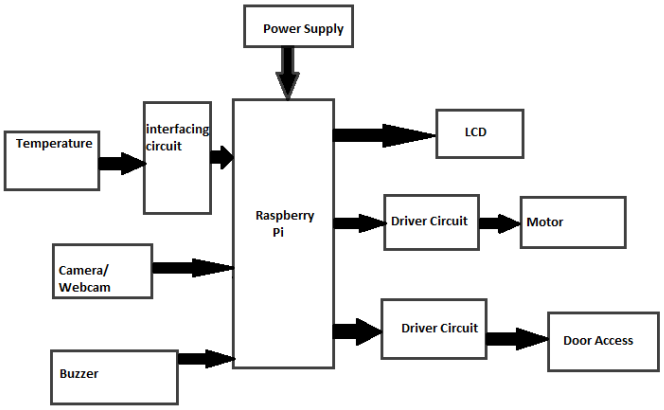


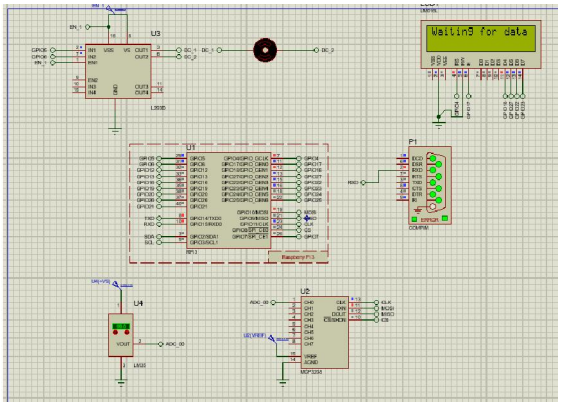
Fig 4.1:Block Diagram

V. SYSTEM DESIGN DESCRIPTION OF EXISTING MODEL

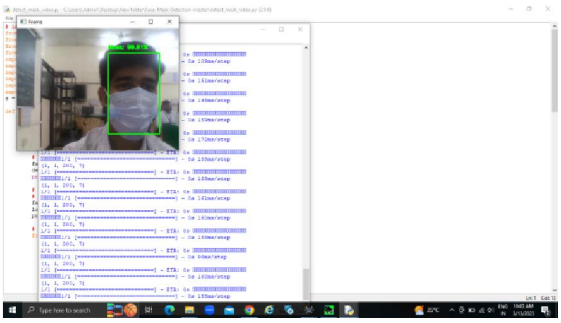
This model includes a Raspberry Pi, a temperature sensor, a door access system, an interface circuit, a camera, a buzzer, an LCD display, a driving circuit, and a sanitising motor. On this proposed model, we have used the Fig: In the previous model, there is only mask detection that determines whether a person is wearing a mask on their face. Block diagram for the current model, which includes an automatic sanitization system and a temperature sensor. DESCRIPTION OF PROPOSED MODEL An integrated circuit sensor called the LM35 can be used to measure temperature because its electrical output varies with temperature (in oC) An integrated circuit temperature sensor is the LM35. Why Temperature may be measured more precisely than with a thermistor by utilising LM35s. Because the sensor circuitry is enclosed, it cannot oxidise or decay. The output voltage may not need to be amplified because the LM35 produces a larger output voltage than thermocouples. It produces voltage that varies in direct proportion to temperature in degrees Celsius. The components' scale factors. A buzzer or beeper is a mechanical, electromechanical, or piezoelectric audio signalling device. Buzzers and beepers are frequently used as alarm clocks, timers, and to validate human input such a mouse click orkeyboard. The electromechanical system used by early devices was exactly like that of an electric bell, excluding the metal gong. Similar to this, a relay might be set up to cut off its own activating current, which would buzz the contacts. In order to use it as a soundingboard, these units were frequently fastened to a wall or ceiling.

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 1, June 2023

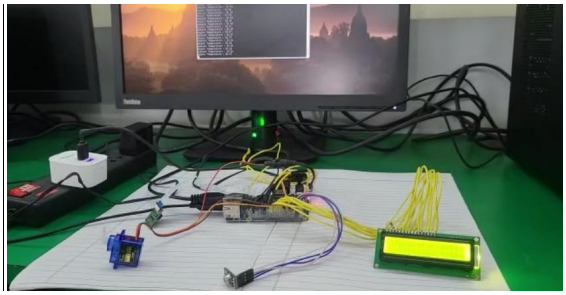
VI. SIMULATION RESULT



Hardware Result



Hardware Requirements



VII. CONCLUSION

In this work, an IoT-enabled smart door is developed to monitor body temperature and detect face masks that can enhance public safety. This will help to reduce manpower while also providing an extra layer of protection against the spread of infection. The model uses a real-time deep learning system using Raspberry pi to detect face masks, and temperature detection as well as monitor the count of people present at any given time. The device performs excellently when it comes to temperature measurement and mask detection, the trained model was able to achieve a result of 97 percent

REFERENCES

[1]. A. Rosebrock," COVID-19: Face Mask Detector with OpenCV, Keras/TensorFlow, and Deep Learning", May 4, 2020,

[2]. https://www.pyimagesearch.com/2020/05/04/ covid-19-face-mask-detector-with-opencv-kerastensorflow-and-deep-learning/ 2. Lim, M.G., &Chuah, J.H. (2018).

IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal
Impact Factor: 7.301
Volume 3, Issue 1, June 2023

[3]. Durian Types Recognition Using Deep Learning Techniques. 2018 9th IEEE Control and System Graduate Research Colloquium (ICSGRC). Doi:10.1109/icsgrc.2018.8657535.

[4]. Carlo Alberto Boano Matteo Lasagni Kay Romer Tanja Lange. "Accurate Temperature Measurements for Medical Research using Body Sensor Networks".

[5]. K Baskaran, Baskaran P., N. Kumaratharan, Rajaram V., "IoT Based COVID Preventive System for Work Environment",

[6]. The Fourth International Conference on I-SMAC (IoT in Social, Mobile, Analytics and Cloud) (I-SMAC) IEEE Xplore Part Number: CFP20OSV-ART; ISBN: 978-1-7281-5464-0