

IOT FACE MASK DETECTION & BODYTEMPERATURE SCANNER FOR COVID

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Abstarct

COVID 19 pandemic is causing a global health epidemic. The most powerful safety tool is wearing a face mask in public places and everywhere else. The COVID 19 outbreak forced governments around the world to implement lockdowns to deter virus transmission. According to survey reports, wearing a face mask at public places reduces the risk of transmission significantly. The proposed model can be used for any shopping mall, hotel, apartment entrance, etc. As an outcome a cost-effective and reliable method of using sensors to build a healthy environment. Evaluation of the proposed framework is done by the Face Mask Detection algorithm using the HAAR CASCADE library. Besides, the body temperature of the individual is monitored using a noncontact temperature sensor. This proposed system can detect the users from COVID 19 by enabling the Internet of Things (IoT) technology.

Keywords: Arduino UNO, Temperature Sensor, I2C LED Display

I. INTRODUCTION

The coronavirus disease, or COVID-19, which originated primarily in Wuhan, China, has rapidly spread to several countries, including India, the world's second-most populous country with a population of more than 134 billion people. With such a large population, India would have trouble preventing the spread of the coronavirus. Face masks and sanitizers are the most effective ways to minimize transmission. When it comes to reducing disease transmission, this has shown good results. Fever, sore throat, tiredness, loss of taste and smell, and nasal congestion are all common symptoms of coronavirus infection. The majority of the time, it is transmitted indirectly through surfaces. The incubation period can be very long, ranging from 10 to 14 days in extreme cases, and the virus can attack directly (from one individual to other individuals) by respiratory droplets. Governments implemented a variety of protection and safety initiatives to reduce disease transmission, including social distancing, mandatory indoor mask-wearing, quarantine, restricting citizens' traveling within state boundaries and abroad, self-isolation, and the exclusion and cancellation of big social occasions and meetings. From work activities to social relationships, all kinds of sports activities, as well as off-screen and on-screen entertainment have all been affected due to this COVID-19 pandemic. Individuals with high body

temperature are not to be permitted to enter public places because they are at a high risk of infection and spreading the virus; wearing a mask is essential. At the entrances to any city, workplaces, malls, and hospital gates, temperature and mask checks are also necessary. As a result, a smart entry device that automatically monitors human body temperature and detects a mask at the door opening system is developed. An advanced idea is used in this system approach, which is a combination of all three including temperature detection, total people count, and mask detection.

II. LITERATURE SURVEY

The importance of body temperature assessment in clinic diagnosis and therapies cannot be overstated. There are some drawbacks, including low measurement accuracy and a long measurement period. Traditional artificial measurement methods make it difficult to track patient body temperature in a timely manner automatically and accurately. To address the above problem, they presented a distributed monitor system that is used for measuring body temperature. Multi-temperature sensors, such as the DS18B20, were attached and are used to capture a person's body temperature signal, after which the SCM AT89C52 processed the signal. The role of data-driven mobile

applications in combating the COVID-19 pandemic is examined. Innovative case studies demonstrate two indoor safety monitoring and resource planning as evidence of practice during a serious pandemic. The corresponding multiplatform mobile applications were built using the App Sheet Framework, which automates the development of Google Sheets as a data source.

Unless the situation changes today, institutions such as the academy are at risk of closing down in light of the COVID-19 pandemic. COVID 19 is a virus that causes serious respirational problems, also called Serous Acute Respiratory Syndrome. Corona virus-2 is a contagious disease that is transmitted through respiratory droplets from an individual who speaks, sneezes, or coughs. It is easy to spread, due to close contact with infected individuals and contact with infected objects or surfaces. Because COVID-19 vaccines are not widely available at the moment, the only way to protect ourselves is to avoid infection.

Implementation of facemask detection with alarm systems for physical distancing utilizing deep learning technique using CNN is discussed in. The researchers introduced a high accuracy strategy for detecting facial masks based on fully convolutional networks, gradient descent, and binomial cross-entropy by using semantic segmentation. The use of CNN to improve the accuracy and speed of the cultivar's recognition was devised to classify the numerous cultivars of Dario libertines (or commonly known as durian) based on the crop's visual structures [10]. Production of pulse oximetry kits using Internet of Things (IoT) technology as instruments for monitoring of covid-19 patients remotely via smartphones in terms of physical and social distancing protocols was utilized to track the body temperature of the individuals.

III. EXISTING SYSTEM

It is existed by using Raspberry pi based face mask detection and body temperature scanning.

It is costly and development also difficult as compare to Arduino UNO based development.

IV. PROPOSED SYSTEM

Real time face mask detection and body temperature detection.

Enhance public safety to reduce spread of COVID.

It monitoring the each individual person by using the ESP-32 CAM

Block Diagram

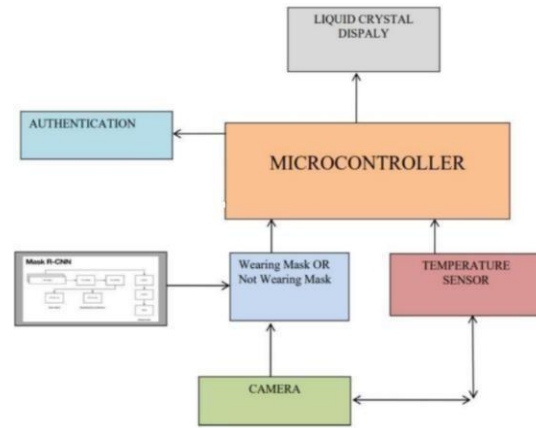


Fig: Face Mask Detector & thermal Scanner For COVID Care

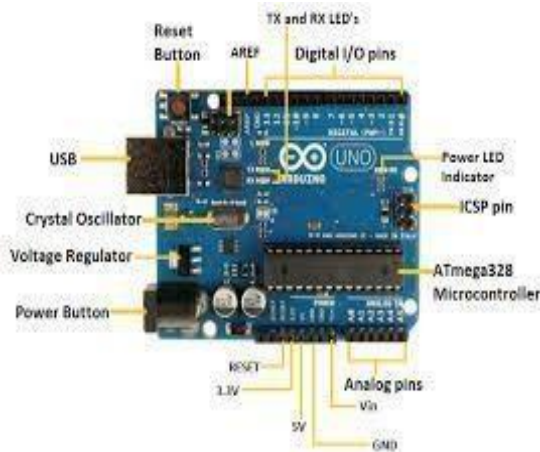
V. SOFTWARE

Python is a widely used general-purpose, high-level programming language. It was initially designed by Guido van Rossum in 1991 and developed by Python Software Foundation. It was mainly developed for emphasis on code readability, and its syntax allows programmers to express concepts in fewer lines of code. In the late 1980s, history was about to be written. It was that time when working on Python started. Soon after that, Guido Van Rossum began doing its application-based work in December of 1989 by at Centrum wiskunde & Informatica (CWI) which is situated in Netherlands. It was started firstly as a hobby project because he was looking for an interesting project to keep him occupied during Christmas. The programming language which Python is said to have succeeded is ABC Programming Language, which had the interfacing with the Amoeba Operating System and had the feature of exception handling. He had already helped to create ABC earlier in his career and he had seen some issues with ABC but liked most of the features. The language was finally released in 1991. When it was released, it used a lot fewer codes to express the concepts, when we compare it with Java, C++ & C. Its design philosophy was quite good too. Its main objective is to provide code readability and advanced developer productivity. When it was released, it had more than enough capability to provide classes with inheritance, several core data type exception handling and functions.

VI. METHODOLOGY

ARDUINO UNO:

Arduino is an open-source computer hardware and software company, project, and user community that designs and manufactures single-board microcontrollers and microcontroller kits for building digital devices and interactive objects that can sense and control objects in the physical and digital world. The project's products are distributed as open-source hardware and software, which are licensed under the GNU Lesser General Public License (LGPL) or the GNU General Public License (GPL), permitting the manufacture of Arduino boards and software distribution by anyone. Arduino boards are available commercially in preassembled form, or as do-it-yourself (DIY) kits.



BUZZER:

The buzzer is a sounding device that can convert audio signals into sound signals. It is usually powered by DC voltage. It is widely used in alarms, computers, printers and other electronic products as sound devices. It is mainly divided into piezoelectric buzzer and electromagnetic buzzer, represented by the letter "H" or "HA" in the circuit.

According to different designs and uses, the buzzer can emit various sounds such as music, siren, buzzer, alarm, and electric bell.

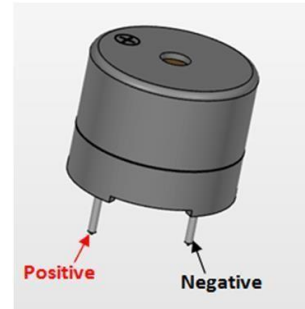


Fig: BUZZER

TEMPERATURE SENSOR:

Contact less infrared temperature sensor measures the surface temperature of an object depending on the emitted IR waves of the target without touching it and also measures the average temperature over an area. It is a contact less, high precision, high resolution and a fast response sensor. It works with 3.3v/5v MCU system directly.

It is based on the optical analysis of the infrared radiation emitted by the measurement object. This radiation is focused through a lens onto a detector which translates it into an electrical signal. This can then be converted to an output size proportional to the object temperature by means of signal processing

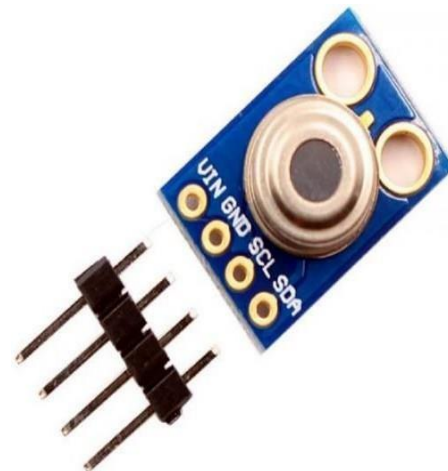


Fig: TEMPERATURE SENSOR

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ADVANTAGES:

- Fully Automatic detection.
- Easy to Manage.
- They're safe and truly contactless.
- Decreases Spread Of COVID.
- They help enforce facemask policies.

APPLICATIONS:

- AIRPORT Entry.
- RAILWAY Entry.
- OFFICE Entry.
- Educational Institutions and Malls.
- Manufacturing Units Entry

VII. EXPERIMENTAL RESULTS

The IOT based face mask detection & body temperature scanning for COVID using Python software is done.

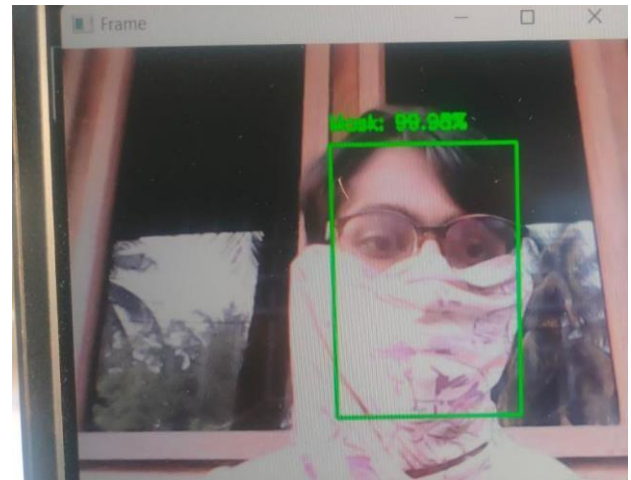


Fig: With face mask



Fig: Body temperature values

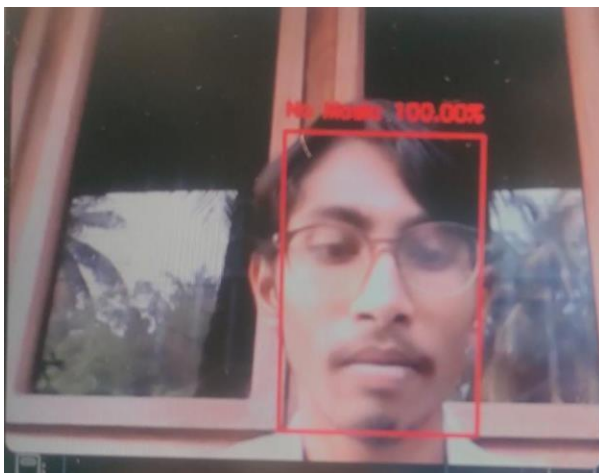


Fig: Without face mask

VIII. CONCLUSION

The main purpose of the developed system is to avoid the spread of COVID-19 in public places such as shopping malls, offices, and so on. The system can monitor an individual's body temperature and can perform face mask detection. The count of the people inside the room will be shown when the facemask detector model is loaded. When an individual passes through the IR sensor, it will proceed to the next level only if the people count inside the room is less than the defined limit. Then the temperature sensor detects their body temperature, and if it is less than the set limit, the Pi cam activates and checks if they are wearing a mask. The

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door automatically opens if the mask is detected and the count goes up by one; otherwise, the person is not allowed and the count stays the same. Similarly, if another person passes through the IR sensor, it tests their body temperature; if they meet all of the requirements, the count increases by one, and they will be allowed. The count increases until the maximum limit is reached; once the maximum limit is reached, the door will not open.

IX. FUTURE SCOPE

New developments and the availability of smart technologies force to the creation of new models, which will help meet the needs of developing countries. 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 Covid-19 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. The test results demonstrate a high level of accuracy in detecting people wearing and not wearing facemasks, as well as it also generates alarms monitored and recorded. Furthermore, there are numerous techniques to enhance performance to improve results. Future development will include improving the accuracy of these steps, using a combination of various features, and improving performance, as well as producing a mobile app with a user-friendly interface for monitoring.

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