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Covid-19 Indoor Monitoring System with Human Identification

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Abstract: ***Covid-19 has become the worst of all pandemics seen with over 63,549,184 active cases recorded globally as on January 16, 2021. India alone has 10,553,529 active cases till date. It has brought on a new era and new way of life-rather reality where in safety has become a must for survival. Form the statistics it is observed that the number of active cases and health rate have only increased abruptly post lockdown even after implementing the guidelines proposed by the government to tackle the problem of the hour. since fever is developed in most communicable diseases, body temperature monitoring is effective for such disease, body temperature monitoring is effective for the prevention of outbreak of such diseases. Covid-19 being one of such, temperature records of symptoms and it is checked prior to allowing a person in, In social stratum it is done by person one should hold the temperature gun at entrance, and the sensor records is often inaccurate. This method also involves two people standing close, which itself is a problem in social-distancing rule. In this paper to design and develop Covid-19 indoor safety Monitoring with human identification using iot based devices. social distancing- since we use hands-free temperature sensing method which records the accurate temperature as well as human identification.***
Keywords: IOT, Indoor-safety, Human Identification with high Temperature.

I. INTRODUCTION

Coronavirus disease 2019, generally addressed as covid-19 is a contagious (communicable) disease. The first case was identified in Wuhan, china in December 2019. It has since spread worldwide, which led to an ongoing pandemic. In the current wake of the covid-19 pandemic. Preventing and or limiting the community spread of the virus is most difficult task, with governments and administrations across the world applying different strategies to restrict population movement and social interaction. A recent survey conducted on 5800 small US business concluded that 43% of business were temporarily closed and falls in the employment of 40%. Symptoms of Covid-19 are variable, but ever one of the most important symptoms of covid-19, but due to the contagious effect, its measurements can become a serious problem, so it is important to perform the temperature detection of patients very quickly and possible without any contact including cough, fatigue, breathing difficulties and loss of smell and teste. On the other hand both epidemiological and laboratory studies have revealed that ambient temperature could affect survival and spread of coronavirus, so that a continues monitoring of temperature, reading both ambient and body temperature, is an essential task to be performed int contrast of covid-19. The adoption of thermographic system in the framework of pandemic situations, such as COVID-19, can be decisive for initial temperature assessment devoted to medical purposes, namely:

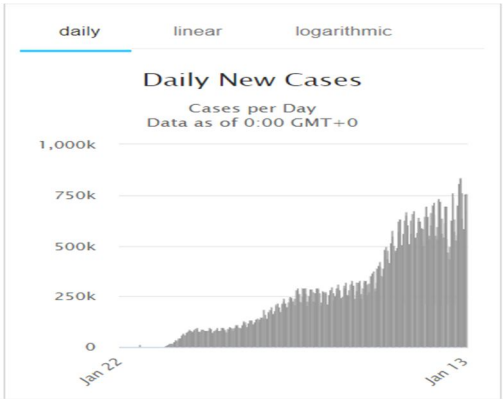
1) Initial human temperature screening during the triage process in a public health emergency, to determine the significance of fever and elevated temperature with respect to possible affection:
2) Temperature assessment within high throughput areas, such as educational institute, airports, etc.

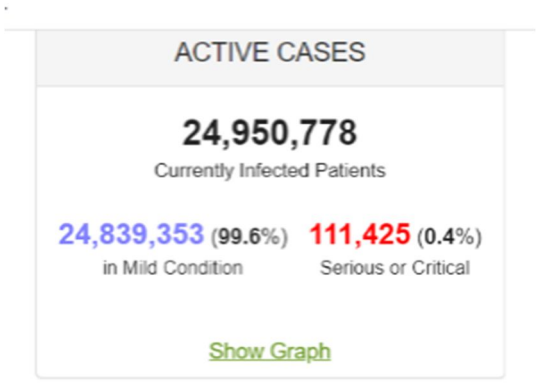
Taking into consideration the major problem of contact and the major symptom in symptomatic communicable diseases, we intend to prevent the further rapid spread of the virus by implementing temperature sensing while maintaining social distancing. The project we develop tackles both the problems. Hands-free temperature sensing tackles installed at the door takes care of the latter eliminating the need for a person at the door thus eliminating the close contact and further spread of the virus. The sensor used is more accurate than the one in the gun and gives more accurate readings- tackling the first problem.

II. LITERATUER SURVEY

In paper [1], the author discussed about the , Globally 24,950,778 active Covid-19 cases have been recorded as on January 16, 2021. It has been the worst of all pandemics leading Spanish flu. The statistics below shows the active cases recorded over the period globally. India alone has 10,543,659 active recorded cases

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In paper [2], the author proposed Ning Bin. Wu Yuchuan. The development of infrared temperature measurement is helpful to non-contact, quickly and accurately measuring moving and high temperature objects. We develop a Infrared thermometer for high temperature object under the premise of high measuring accuracy and low cost. A quick and accurate measurement of the surface temperature for an object was realized. This paper tells us research and recent use of ir sensor.

In paper [3], This paper describes accuracy of non-invasive IR based temperature sensors that have been widely used to check for elevated body temperatures (EBT) during the Corona pandemic. Our algorithm considers factors like humidity, distance, ambient temperature, and emissivity. A device was made that could deploy the algorithm and perform tasks like EBT detection, mask detection, face detection and face recognition and subsequently store the inferences of all these models on a cloud or local sever accessible via http requests

In paper [4], R. V. Gomeseria, "Building Services Design to Prevent the Spread of COVID19", pp. 1-18, 2020. This paper aided us, that about map reduce framework and working of it.

In paper [5], Since fever is developed in most people infected by communicable diseases, body temperature monitoring is effective for the prevention of outbreak of such diseases. Because of outbreaks of influenza in Hong Kong, some schools are required to measure the students' forehead temperature when they arrive at the school. The repetitive tasks of attendance taking and temperature logging consumes considerable amount of manpower, time and administrative resources. To facilitate such daily operations at the school entrances, an automated system with the temperature measurement is being developed in collaboration with an access control company in Hong Kong. This paper presents our prototype system, which consists of non-contact temperature sensor, embedded system, and database.

In [8], the author clearly specified how data will be fragmented into blocks which in turn will provide security for the stored data.

In [9] the author implemented the concept of providing data verification for the stored data in au untrusted cloud server is been done.

III. DESCRIPTION OF MODULES

A. Admin

Administrator is responsible for adding the users into the cloud. While adding a user the administrator will provide the pictures of a user and the details. The pictures of the candidate are going to store in the firebase cloud [10][11] the administrator will get the emergency notification from the Raspberry Pi. With this information the administrator can track the high body temperature persons.

B. Raspberry Pi

Raspberry Pi will draw the pictures and user details from the firebase cloud [12] under Raspberry Pi will convert all pictures as a single file in pickle format while the person entering in front of the camera the Raspberry Pi will compare the face of the person with the stored pickle file. With this comparison Raspberry Pi will recognize the person and the Raspberry Pi will check the body temperature of a person if the body temperature of the person is normal the Raspberry Pi will allow the person otherwise the Raspberry Pi will send a notification to the administrator with the person details so that admin can track that person.

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IV. PROPOSED SYSTEM

The Raspberry Pi model will be connected to the laptops, pc or any screens using the USB cable. Raspberry Pi model consist two modes ENROLLING MODE and SEARCHING MODE.

In Enrolling mode new person is added from the mobile application and details of the person will be stored in FIREBASE cloud, In this mode persons image will be captured by Raspberry Pi using camera, and captured images will be converted into dot pickle format and stored in Raspberry Pi.

In searching mode if the person detects with high temperature Raspberry Pi will notify with buzzer and captures the persons image, Using CNN and HAAR cascade algorithm persons image will compared with the dot pickle format file stored in Raspberry Pi.

If the persons detail is available in the cloud Raspberry Pi will notify the administrator with present temperature of the person through the android application.

V. RESULTS

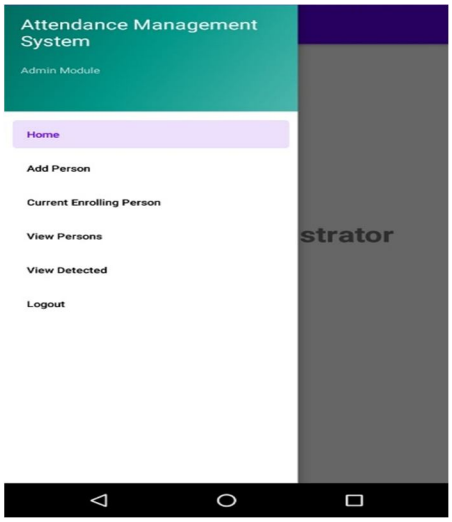


Fig1.Attendance Management System

This is android app for Monitoring Attendance management System

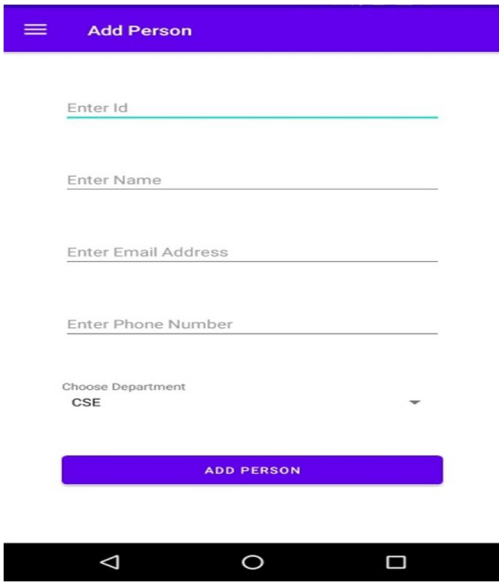


Fig2. Adding New Person

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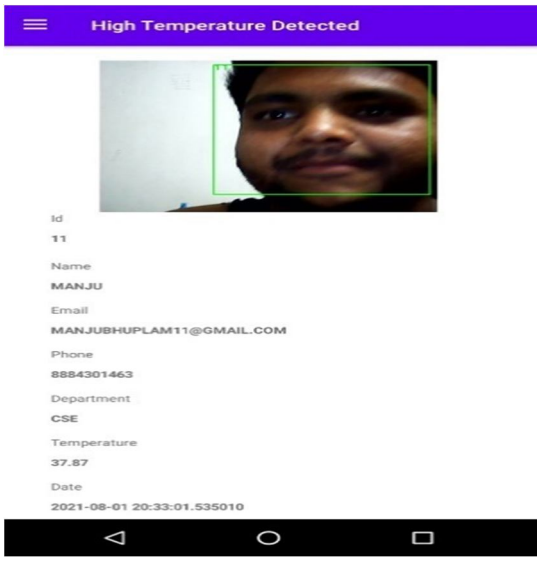


Fig3. High Temperature Detected person

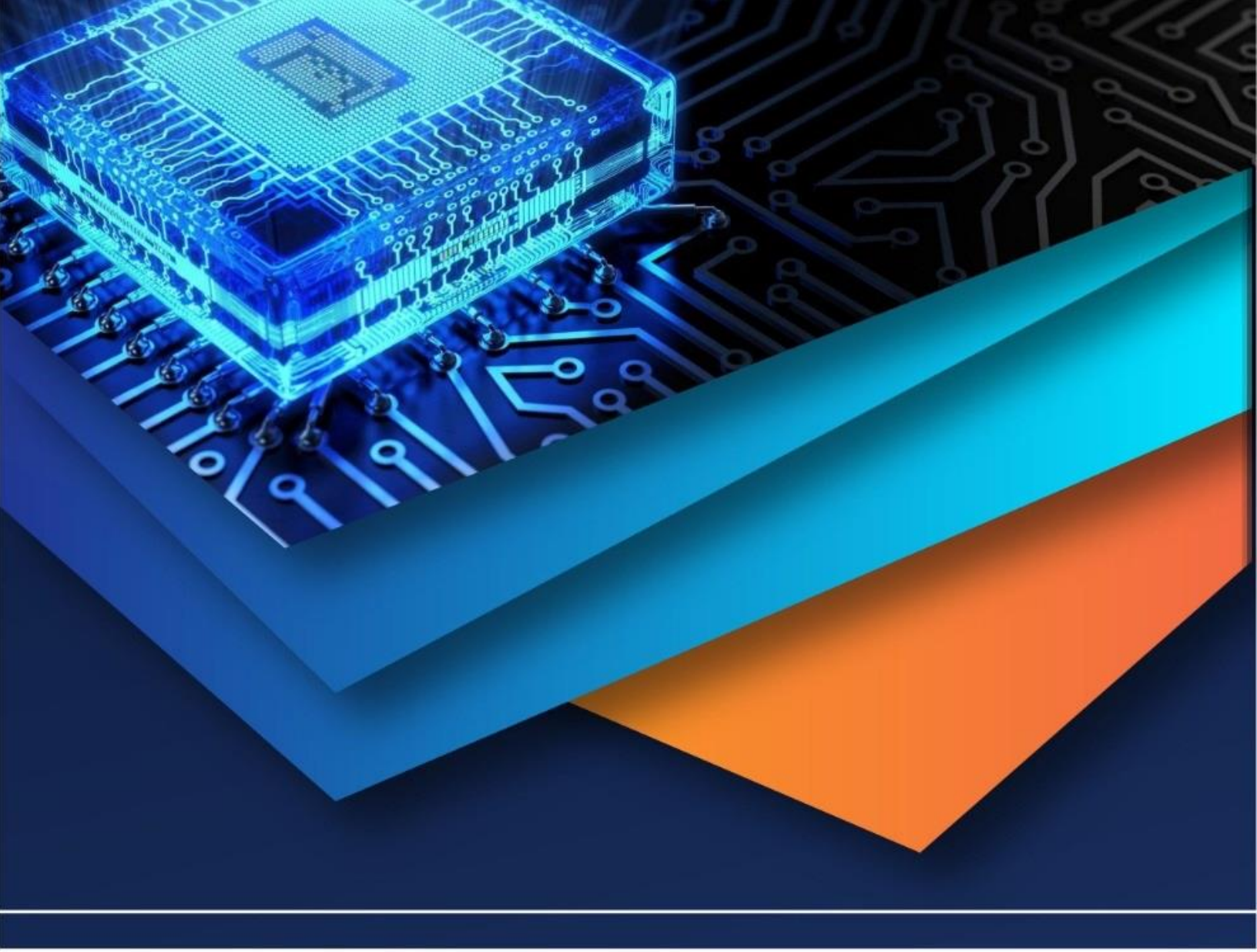
VI. CONCLUSION

The proposed solution is usable for its purpose under certain performance limitations. Moreover, it relies on both open hardware and free software, being a definite and desirable advantage for such systems. In the future, it is planned to experiment with various deep learning and computer vision frameworks for object detection on Raspberry Pi in order to achieve higher framerate. Moreover, we would like to extend this solution with environment sensing mechanisms for adaptive building protection in order to reduce the spread of coronavirus indoors, especially during summer. Finally, the ultimate goal is to integrate the system presented in this paper with our framework for efficient resource planning during pandemic crisis in order to enable efficient security personnel scheduling and mask allocation, together with risk assessment based on statistics about respecting the safety guidelines.

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