

# Prevention of COVID Spread: A Review

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**Abstract:** The COVID-19 pandemic has exposed the vulnerabilities of dated entrance and visitor management systems at Indian workplaces. Even after undergoing a digital transformation, many offices in the country still rely on manual attendance marking systems and physical access cards, which can pose significant health risks to employees in the wake of the coronavirus crisis. We are making use of the technologies such as image processing and IoT to maintain social distancing, to have a real-time monitoring and analysis of employee/worker, and to create a contactless authentication system which is the alternative for biometric scanners.

**Keywords:** Coronavirus, Face mask detection, Body temperature detection, OpenCV, Social distancing, RFID, Image processing.

## 1. Introduction

The effects of the coronavirus outbreak have seriously affected our daily lives, including the way we work. Offices are temporarily closed because remote working is the new standard. But there are also organizations whose doors have to be opened every day. Industries that provide essential services (food manufacturing, biotechnology, pharmaceuticals, utilities, etc.) need to keep their operations going to support society during this pandemic. "Prevention of Covid Spread" is mainly focused on resolving the plight that our world is facing, that is covid-19.

## 2. Literature Survey

[1] Focused on radio frequency identification technology, it is communication technology. The data is read and written without direct contact. Today, as life becomes cognitive, RFID technology is widely used in access control, supply chain, security, facility management and production control systems. This document mainly focused on the schematic design of an RFID-based intelligent access control system. First, the functional principles of RFID are presented, and then other traditional access control contacts are compared with the intelligent RFID access. The design method and operation of the access control hardware and software. RFID offers integrity and security. The costs for RFID access are also low, which is an advantage. We think intelligent access control will soon be further developed. This technology makes life and works safer and more reliable.

The paper [2] focuses on the prevention of the fast spread of COVID-19 by wearing masks in public areas. Reports show that wearing face masks at work reduces the risk of infection. A systematic approach is designed to create a safe environment in workplaces. A model that is a face mask detector using machine learning and deep learning is presented. The database of face mask detectors consists of a mask and without mask images. They used OpenCV, Pytorch, Tensor Flow, CNN, Keras. The main goal of this project is to find out whether the person in the image/video sequence is wearing a mask or not. The development of a face mask detector would serve the purpose effectively.

Referenced article [3], the authors discuss the design of a non-contact infrared thermometer due to the disadvantages of conventional mercury thermometers, such as object and body temperature by SCM to process temperature on LCD screen and alarm when high temperature is detected. This smart thermometer can achieve contactless measurement, it uses a low noise amplifier. It is safe and gives a fast response as compared to a mercury thermometer. It is made more efficient by designing an LCD and the over-temperature alarm.

In [4], they presented an IoT-based solution with the aim of increasing COVID19 security measures indoors. Covers various applicable aspects 1) non-contact temperature detection 2) Face mask detection 3) Social distancing verification. The non-contact temperature detection system is based on Arduino Uno uses a thermal camera or infrared sensor, while social distancing control and face mask detection is performed on the user computer vision techniques. A Raspberry Pi equipped with a camera. In addition, they plan to expand this solution to include an environment detection mechanism for air conditioning and ventilation as well as air protection in order to prevent the rapid spread of COVID19 indoors.

The work [5] is based on the human recognition of social distancing and security breaches. It is difficult to destroy the coronavirus case diagram if citizens do not follow the rules to prevent the virus from spreading. One of the good and most important habits with this outbreak is maintaining social distancing, which as a precautionary measure reduces physical contact between people. The study mainly focuses on the OpenCV library for image processing and Mobile Net Single

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Shot Multibox Detector (SSD) for detecting the people in areas of hope. The distance between two people recognized in the recorded images is measured and then compared with the fixed pixel values. In the segmented tracking area, the distance between the overlapping border and the centre points is measured. If an unsafe distance is detected between two people, a warning appears to keep a safe distance. Another important feature of this system is the detection of the presence of people in restricted areas. Based on the overall result, the objectives of this study are achieved. However, there are some limitations in the results obtained. The model has difficulty correctly recognizing people outdoors and has difficulty with distant scenes.

Mingjie Jiang, Xin qi Fan and Hong Yan [6] have portrayed an innovative face mask indicator, named Retina Facemask, which was to pay to community healthcare. The backbone of this architecture is Res Net or Mobile Net, the neck is FPN and heads are contexted attention modules. In addition, they have developed a new main background viewing module that focuses on facial features and masks, and a novel cross-class algorithm for removing elements, i.e. The experiments are more accurate even if the images contain blurry images without masks.

The paper [7] familiarizes the function additives of RFID generation and its middle abilities like scalability and security. The RFID machine in particular includes RFID Tags, and reader, Middleware and a Backend record. The development of RFID generation together with the man or woman of its mechanisms inside the company is defined inside the first part of the paper. The viability of the enticing RFID era and its deserves of superior efficacy at dropped expenses are mentioned inside the 2nd part of the paper. Numerous realistic implementations of the RFID era are highlighted inside the remaining part of the paper. From this paper, we can finish that the RFID era guarantees expanded effectiveness and progressed efficiency. Here is a comparison table between Manual entry, Bar code and RFID technology.

Table 1  
Study result. Ref [7]

Method	Total Number of Students			
	1	10	60	100
Manual entry	10 secs	100 secs	600 secs	1000 secs
Bar code	2 secs	20 secs	120 secs	200 secs
RFID Technology	0.2 secs	2 secs	12 secs	20 secs

Article [8] suggests an IoT decision on instant temperature control called IRT. The IRT is made from a hardware version for a range of temperature statistics and web support for statistics support. An IR thermometer sensor module is used in IRT which incorporates MLX90614 which is used for the provision of an article and Real-time room temperature control. For the collection of data and storing the history of temperature evolution, a Web application is used. The results of this experiment are capable, in lieu of a noteworthy involvement to IR temperature supervising systems grounded on IoT. It is also said that the solution required additional trial authentication for improving system calibration and accurateness.

Abdul-Adheem and Wameedh. [9] have proposed a system that is used to measure the distance or the displacement of an object, with the help of laser optics and trigonometry. This system was developed using a dual laser and a CCD camera which is used for recording images that are processed to obtain the distance from an object. The two main improved processes of image processing techniques explained in this paper are,

- 1) The detection of a laser spot using image processing.
- 2) Distance is calculated based on laser spot position on the image and the relationship between pixel number and distance is figured.

This system is focused on minimising the cost significantly but not at the stake of the accuracy of the system which happens to be up to 4%.

In this paper [10], have projected approaches that are grounded on renowned algorithms that can be used in distance measurements. The focus is on the multidimensional image indexing and division measures and they have shown the abstraction of feature vectors that can be used in image recovery. They shown that some of the problems are still unresolved outcome the appropriate kernel colours, brink values and neighbourhood classifications to accomplish improved results.

In article [11], a non-contact IR thermometer from the MLX90614 sensor and STM32F107 microprocessor is designed for a non-contact liquid security identification system. Here they have shown the hardware circuit and the flow of the firmware of the IR thermometer. They have automated the software program using Keil C and debugging with Keil uVision4 MDK V4.22. Also, they have measured the temperature of bottles of different parameters and have concluded that it is highly reliable and consumes low power and real-time response.

In the paper [12], they compared 3 IR heat detection systems, i.e., FLIR ThermoVision A20M, OptoTherm Thermoscreen and Wahl Fever Alert Imager HSI2000S. The condition considered for the fever detection is that oral temperature must be greater than 100°F and also self-reported fever was also taken in for the experiment. The results showed that FLIR and OptoTherm were highly reliable in detecting the high temperatures and the AUCs of both depicted that with greater sensitivity they can distinguish between febrile and afebrile persons.

Reference [13], Proposes a design of high precision non-contact real-time temperature measurement upon distance compensation. Along with the microcontroller, a laser range module is used to get the distance values and particularly used to compensate distance measuring impacts on temperature measurement. Individuals were tested to check the accuracy of the device. The results showed a residual error <0.2degree Celsius within a response time of 0.1s and a range of 0-60cm.

The paper [14] includes information about the standards and frequency ranges used in RFID technology. It explains the possible mishaps like a compromise in the privacy of this RFID technology and at the same time provides some solution as well. This paper talks about novel RFID viruses. Also, shows the capacity of the RFID technology, apart from the supply chain

management, pointing and tracking objects in motion, new manufacturing methodologies for the tags.

Article [15] shows a comparison of classifiers such as MobileNetV2, RESNET50, VGG16, each with ADAM, ADAGRAD and SGD optimizers. These are the few classifiers with different optimizers that need to be evaluated in order to be implemented on a larger scale. As a result of evaluating multiple classifiers, ADAM's optimizer performance appears to be decent and the accuracy of the SGD test is roughly equal to that of ADAM, which is used for all 3 classifiers. Also, when experimented, found that the MobileNetV2 -Classifier gives the best results with zenith accuracy.

The reference [16] talks about RFID in general. Radio waves– time- inverse identification utilizes electromagnetic fields to identify and trail tags committed to objects. The paper reviews RFID and its applications. It gives an ephemeral outline about the principle and classifications of RFID tags and readers, frequencies used, current applications, limitations and its advantages.

In the article [17], have registered in the IRT systems used to screen travellers at the airport and the Hong Kong border crossing due to the outbreak of severe acute respiratory syndrome. The Thermo CAM Investigator is the software algorithm used to extract the IRT temperature of selected areas of the face. This data analysis was based on age and gender.

The paper [18] shows the detection of the presence of the face mask on the human face in live streaming applications (these images were taken from resources such as Kaggle and RMFD datasets). The 2 main methods used for object detection, based on deep learning, studied here are one stage and two-stage. And the architecture used here for object detection purposes is one stage i.e., Single Shot Detector. SSD is used due to its speed and accuracy.

Madhura Inamdar and Ninad Mehendale [19] designed real-time face mask identification and here the main goal of the face mask network model is to identify the person wearing the mask or not and also to use the images to identify whether the person is wears the mask. Deep learning can be used in unverified learning algorithms to handle the ungrouped data.

### 3. Conclusion

The main purpose is to prevent the spread of coronavirus in the workspace by detection of face mask and detection of body temperature of the person. By the use of OpenCV and handles mentioned above mask detection and maintain the database is possible. The fusion of the MLX90614 sensor and STM32F107 microprocessor as mentioned in the papers make contactless temperature detection possible. This can be used as an

alternating system for biometric authentication.

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