

Role of IoT to Avoid Spreading of Covid19

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Abstract. To determine the capabilities of this technology, we refer to different research papers related to this topic. This literature-based research could assist practitioners in devising responses to relevant issues and combating the COVID-19 pandemic. This paper examines the position of IoT-based technology in COVID-19. It looks at state-of-the-art architectures, networks, implementations, and industrial IoT-based solutions for combating COVID-19 in three stages: early detection, quarantine, and recovery. Since 2020 was a challenging year for all of us, and during this pandemic, we all realized that social gatherings had to be avoided, and the serious issue was to handle it. So to tackle this and ease the handling of the Corona Virus, we developed an automatic door that monitors an individual's temperature and whether the person is wearing a mask. In the absence of a mask, it clicks a picture of the person and stores it in the database for future reference.

Keywords. IoT, COVID-19, sensors, innovative hospitals, healthcare.

1. Introduction

Coronavirus disease 2019, COVID-19. This virus originated from the WUHAN seafood market, which is situated in CHINA. This virus is considered the family member of the SARS virus. The first patient who suffered from this virus was found in December in WUHAN. Some people are infected by this virus but do not show any signs or symptoms because of the dependency on a person's immune response. Some people will have minor symptoms, but they will go away. However, some people may face difficulty in breathing. If a person is older or has already had a health problem like diabetes or heart disease, this virus will cause severe symptoms. The following are the foremost common symptoms: Ninety-eight percent of people have a fever. Sixty-eight percent of people are tired. Sixty-three percent of people have a dry cough and a thirty percent loss of appetite. Twenty-eight percent of people have body aches. Forty-one percent of people have trouble breathing. In India, the covid cases started increasing in March 2020. This was a crucial time for India because India was unaware of this virus. But India initiated to fight against this virus by making Lockdown in the whole country and making isolation wards for people traveling from one place to another. This strategy worked in the starting, but as time passed, the Indian government had to drop the plan of Lockdown due to other consequences of Lockdown. So now, to defend against this virus, India has to search for alternatives like spreading the news of social distancing and making people aware about wearing masks, etc. I later also played a significant role in fighting against this virus. I provided those facilities which were very much required like to help the doctors to give health status of the patients etc.

Internet of Things (IoT) is a technology that helps to connect and help to communicate between different devices with the help of the Internet. First, these devices are embedded

with certain electronics, software, and hardware. Then these devices are connected to the Internet to communicate with the other instruments.

IoT also helps maintain the people's diet by calculating the number of calories, vitamins, etc., taken by the person with the help of sensors. In addition, IoT can help remind the patient about the medication time with a doctor regularly. IoT technology gives developing countries the potential to combat COVID-19 effectively and, more significantly, accelerate the digitalization of healthcare systems, closing crucial gaps in affordability, efficiency, and access. Beyond COVID-19, IoT advancements could aid in predicting future pandemics by combining statistical-based approaches with artificial intelligence and big data. This could place IoT as a critical enabler of the healthcare transition from a reactive to a constructive environment. The Internet of Things has been widely used to link advanced medical resources and provide people with intelligent and reliable health care services. Advanced devices may be worn or implanted into patients' bodies to track their health progress continuously. The data gathered in this way can be analyzed, aggregated, and mined to make early disease predictions. The processing algorithms assist clinicians in personalizing treatment while also helping reduce the cost of health care and improving outcomes. This article discusses the problems of implementing an IoT health monitoring framework. To determine the capabilities of this technology, we looked at research papers on IoT in healthcare and the COVID-19 pandemic. This literature-based research could assist practitioners in devising responses to relevant issues and combating the COVID-19 pandemic. This paper examines the position of IoT-based technology in COVID-19. It looks at state-of-the-art architectures, networks, implementations, and industrial IoT-based solutions for combating COVID-19 in three stages: early detection, quarantine, and recovery.

2. Problem Statement

In the present technology era internet of things (IoT) is available worldwide. These devices are duly connected with unlimited devices used to measure and monitor one's fitness, sleeping patterns, heart rate, pulse rate, oxygen percentage, blood pressure, etc. Therefore, strictly observing the concerned patient at any moment based on the medical requirements to provide required medicine / medical assistance plays a vital role in minimizing the covid-19 pandemic. Moreover, IoT tools help maintain social distance, which is one of the essential factors to breaking the chain of covid -19 by knowing the quality of air, cleanliness, workspace areas, hotels, gyms, etc.

The IoT tools help make an intelligent bed according to The need of covid -19 patients, which can change height in the desired way. The same can also be automatically adjusted to the appropriate pressure and support to the patients. When needed, the hot data can be predicted and diagnosed, and share the results by streamed the services and prevent people from uncalled for wandering here and there. In addition, medical robots detect a center, measure people's temperature, and provide medicines in isolation.

During this pandemic, people have become helpless in their regular duties, and even educational institutions have also been completed to organize online classrooms and distance learning. This unfortunate pandemic has provided various opportunities to learn from the available extreme of social innovation and experiments by working from home to surveillance. It accelerates to aim and attract innovations and research to fight challenges caused by the covid -19 by applying infrastructures, immunity enhancement

disease prediction, health care, social gathering, living styles of a safe society, and a safer way to use the building, etc. [1-4].

Trends of use of virtual working, digital collaboration, productivity-related workplace tools, etc., and cloud interaction For IoT-based safety measures are playing an essential and valuable role in checking the black spot Corona.

2.1. Advantages and disadvantages of covid -19 on IoT tools

Covid -19 severely unforeseen impacts our society, economy, and the Internet of things. By applying IoT tools like Track and trace, remote assets and specific healthcare use cases benefit from these shifting needs due to the analytics use of IoT tools. Such impacts, in short, maybe as under:

In general, a decline in technology budgets as the majority of projects are put on hold or slow down. There is a remarkable ramp-up in most technologies such as work from home, e.g., laptops, screens, connectivity, and collaboration tools. Demands for new projects, devices, and services or buying IoT hardware are declining daily. The effect of covid -19 has changed the behavior of employees and employers both. The affected situation warrants thinking and planning about additional investment in digital infrastructure. However, sink no drastic changes have been figured out so precisely as yet, so we may say that IoT networks are mainly unaffected. But it would not be wrong to say that covid-19 has put specific difficulties for the experts to work together, which sometimes resulted in delays in new technology standards. It is very significant to note that covid-19 severely impacts security and privacy as cyber-attacks increase and hacker strategies change. There are more changes to rethink to re-evaluate the privacy by using IOT tools and reorganizing set - up of security. Covid-19 has created such an adverse situation that many companies have stopped hiring IOT talent and are laying off their personnel somewhere. In some areas, many IoT vendors provide free services or software in response to coronavirus. Demand for new jobs is declining.

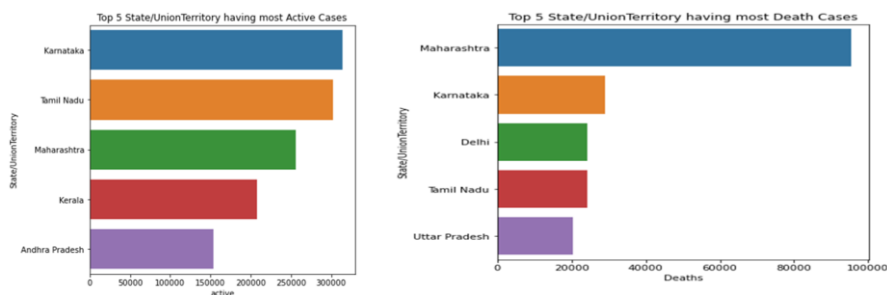


Figure 1. The above graph shows the data of infected people in different states of India.

As the doctor suggests that "prevention is always better than the treatment of that disease." This new type of coronavirus has various symptoms that primarily affect our lungs, so it has become necessary to take precautions against it. The safeguards can be taken in the following ways:

Avoid going to the places where the social gatherings are being done. Always wear the mask in public places, keep a bottle of sanitizer in your pocket, and always keep sanitizing your hands regularly as we touch various surfaces during the day. If you have traveled or come out from outside, always follow the government's anti-corona guidelines and keep some distance from your family members. Take the vaccine as soon as possible to strengthen your immune system and help you combat the virus. Always take a healthy diet, multivitamins, and especially Vitamin C to fight against this virus. If you have initial symptoms of this virus, immediately disconnect from everyone around you and contact the doctor as soon as possible. During the ongoing COVID-19 crisis, IoT has been critical in properly tracking virus-infected patients through devices and interconnected networks. As a result, the industry has inevitably chosen to rely on this networking mechanism to protect people from the virus's dissemination [5-10]. This project aims to sense body temperature and mask automatically open the door. In reality, this project aims to keep new coronary pneumonia patients from infecting other people. This project can be streamed on a computer using an IP address, and the results can be stored in a pre-assigned database.

2.2. Application

At airports, the Face Mask Detection System can be used to identify passengers that are not wearing masks. At the entrance, travelers' faces can be captured in the device. The alert may be sent to them if the person's face is already stored.

Hospitals may use the Face Mask Detection System to see if their employees wear masks during their shifts. If a health worker is discovered without a cover, they will be notified and reminded to put one on. Even if people who are supposed to wear a mask are quarantined, the device will keep an eye on them and detect whether or not they are wearing one, sending an automated warning or reporting.

2.3. Why did we choose this project?

We chose to make this device because of the global pandemic that hit the world in 2019 and continues today. The only prevention methods to stop the spread of COVID-19 are using face masks and maintaining social distance. Not just this, but our device will also help determine the body temperature. If the temperature is not below a certain level, then this device will not allow the person to enter inside and vice-versa. Hence, we designed this device to be used in various public places and residential areas to help prevent this virus.

3. Proposed Application

3.1. Components

1. ESP32-CAM WIFI
2. Arduino UNO
3. E18-D80NK Adjustable IR Sensor
4. Tower Pro MG995 Servo Motor (180deg)

5. 16x2 I2C LCD
6. LM2596 Adjustable DC-DC Converter module
7. 10mm Green LED
8. 10mm Red LED
9. CH340G USB to TTL Serial Converter
10. GY-906-BCC IR Infrared Thermometry Module
11. Buzzer

3.2. Working

When the IR sensor is active, Arduino will send a request to Thermometry Module for testing the body temperature. If the body temperature is less than 31, it will display the message retest. If it exceeds 38, it will show "KEEP OUT." If the body temperature is between 31 & 38, it will display, "BODY TEMPERATURE IS OK," and request the ESP32-CAM to run the face detection algorithm.

Then, ESP32-CAM starts the face detection algorithm. It can begin, whether offline or online, while streaming. The yellow indicates the date that the face is detected. That means this person is not wearing a mask. When this person is wearing a mask, no look is seen. Hence, no box was drawn around his face. Then, after completing ten scans, ESP32-CAM will calculate the percentage of faces not detected and send it to Arduino. Now, Arduino will display the percentage value received from ESP32-CAM. Then, it will open or close the door depending on the importance. The door will open if the percentage value is more than 80%. If not, the door will stay closed.

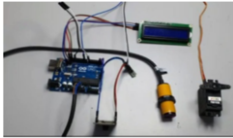


Figure 2. Shows the Assembling of the Circuit.



Figure 3. The display shows the connection to an IP address established.



Figure 4. The display shows the face mask's detection with a matching score.

3.3. Drawbacks

Our system can result in inappropriate reading due to the atmospheric conditions outside the system, like scorching weather, which may result in an inevitable rise in individual assignments [11-14].

2. Our device will require more storage because many people's data are being entered simultaneously, like, if 100 people live in a building, out of which 20 people are rectified without a mask. So, our device will be storing the data of 20 people at the same time. Hence, data storage and processing speed can be a drawback for this device.

3.4. Industrial Uses

Our project is designed so that we can modify certain features or even change them according to the user's will and situations. Therefore, this is an all-fields desired innovation capable of solving several problems with minor changes in its design and working.

The mask detection software in our project can easily be modified to detect the presence of suspicious activities around it. This feature and its database attributes can store the pictures of suspicious people and help prevent certain crimes. The temperature detection feature can be easily converted into a metal detection system to detect the presence of weapons [15-18].

The picture storing database is a system always needed in various fields. This database can be programmed to limit its access by simple security modifications. Our idea is independent of each other and dependent on our project, making it one of the most flexible and user-oriented innovations one can have. Our Automated Doors are one of the most desired products one wants to have nowadays due to this pandemic and its adjustable features, making them an evergreen idea.

4. Conclusion

Although the world is in the grip of the COVID-19 pandemic, many developments have been implemented to tackle the outbreak. The Internet of Things is an evolving information infrastructure that offers improved applications in the medical industry, such as keeping proper medical records of the patients, system connectivity, disease triggers, etc. The sensor-based infrastructure of the IoT is advantageous. Sensor-based technology reduces the surgery risk in complex situations, which may be helpful in a pandemic. In the health sector, it is used to aid the cases of a pandemic. It simplifies the doctor's role by reducing the life risk and improving the betterment of health. Various applications related to healthcare are developed. The proper application of IoT will aid in the correct resolution of different medical problems such as speed, cost, and difficulty. It can conveniently be customized to monitor caloric consumption and COVID-19 patient treatments such as hypertension, diabetes, and arthritis. IoT can help with incurable disease management, patient care, exercise, monitoring of blood pressure, control systems, heart rate monitoring systems, etc. It will monitor patients in real-time and give a more personalized experience in the health sector. Furthermore, IoT-based devices can help with storing data digitally. The health records of COVID-19 patients can be kept digitally and connected to various databases via IoT-enabled computers. This technology will aid in the reduction of manual record-keeping. It removes mistakes and delivers outcomes on schedule with a well-informed judgment. During the COVID-19 Pandemic, healthcare devices became more effective using this technology. As a result, these services provide real-time alerts and promote cooperation, improving the quality of life for patients. This managed the health management system and improved patients' health during a pandemic. This technology will advance in the future to allow for better medical treatment and will be used in the case of a pandemic similar to COVID-19. In the end, IoT can track a patient's vital signs. This would capture all details to avoid complications with the patient's care.

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