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COVID-19 MONITERING SYSTEM

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ABSTRACT

In the present world, IoT is changing the infrastructure of technologies. By facilitating effortless interaction among various modules, IoT has enabled us to implement various complex systems such as smart home appliances, smart traffic control systems, smart office systems, smart environment, smart vehicles and smart temperature control systems and so on in very little space. Increase in covid situation there are many ways that the technology can be used to monitor this situation. So, in this project we are implementing the models for covid testing booth, social distance monitoring and health monitoring. IoT based covid testing booth and social distance monitoring allows us to manage the peoples entering into the booth and standing in queue. Internet of Things (IoT) based smart health monitoring system is a patient monitoring system in which a patient can be monitored 24 hours. Health monitoring systems are one of the most notable applications of IoT.

KEYWORDS

Covid Monitoring System, Internet of Things (IoT), Cloud Server, https Port, WIFI Network.

1. INTRODUCTION

Internet of Things (IoT) is now a reliable technological standard and a heavily researched field. Sensors are being used almost everywhere in the present time, from everyday products to industrial monitoring systems. The use of IoT and sensor based intensive health care systems are increasing rapidly IoT makes our life smarter, more efficient and easier. Using a smartphone as the data computing platform, the prototype model. Provides user-friendly voice recognition and alert functionalities. Several life-threatening diseases can be easily monitored by IoT based systems. Using a smart device, doctors and patients can continuously observe the heart rate and can get important data and take proper steps to prevent severe damages. Heart rate and body temperature are some of the most important traits of the human body which are major contributors to determining a patient's health condition. The microcontroller collects the data using sensors. The collected biomedical data is usually stored in servers. From the stored data, the device can decide whether the patient's condition is normal or abnormal. This device provides real-time health care observation for doctors and medical assistants where they can use the data anytime. Here the main advantage is that the device has low power consumption, better performance, high sensitivity and easy set up. It is assumed that by 2020 there will be about 26 to 50 billion network-connected devices and 100 billion by 2030. Raspberry pi is the most common platform for IoT.

2. LITERATURE REVIEW

In this section, we briefly introduce previous work done on the social distancing in the context of the 2019 novel coronavirus disease. As the disease spread at the end of December, researchers started work to pay their contributions in the deadly situation. Social distancing was suggested as the alternative solution. The different research studies were conducted to provide an effective social distancing solution. In the same background, Prem et al studied the consequences of social distancing measures on the progression of the COVID-19 epidemic in Wuhan, China. They used synthetic location-specific contact patterns to imitate an ongoing trajectory outbreak using age structure susceptible-exposedinfected removed (SEIR) models for several social distancing measures. They interpreted that a sudden rise in interventions will lead to an early secondary peak but it will flatten gradually with time. As we all can understand social distancing is important to cope with the current situation but economically it is a drastic measure to flatten the curve against infectious diseases. Adolph et al emphasized the situation of USA where they gathered state-level responses regarding social distancing and found the contradiction in the decision among policymakers and politicians which causes a delay in imposing the social distancing strategies resulting in ongoing harm to public health. On the brighter side, social distancing helped a lot to control the spread of disease but it has also affected economic productivity. In the same background, Kylie et al have studied the association between transmissibility and social distancing and found that association decreases as transmissibility decreases within different provinces of China. According to the study, the intermediate level of activity could be allowed while avoiding an immense outbreak.

3. EXISTING SYSTEM FEATURE

In this project we have temperature and heart beat readings which are monitored using Arduino ATMega2560. These sensors signals will send to Arduino via amplifier circuit and signal conditioning unit, because the signals level is low (gain), so amplifier circuit is used to gain up the signal and transmit the signals to the Arduino. Arduino is a windows-based operating system works as a small pc processor system. The proposed method of patient monitoring system monitors patient's health parameters using Arduino. After connecting internet to the Arduino, it acts as a server. Then the server automatically sends data to the website. Using IP address anybody can monitor the patient's health status anywhere in the world using laptops, tablets and smart phones. If these parameters go abnormal it will automatically send alert to the doctors. In the same way the covid testing booth and the social distance monitoring is used to manage the queue during covid testing procedure.

4. PROPOSED SYSTEM FEATURE

Internet of Things (IoT) is the emerging technology, which contains huge amount of smart object and smart devices connected to the internet for communicating with each other. In this project to analyze and compute the patient health we are using Raspberry Pi, which is the heart of this project. These smart devices are used to collect temperature, blood pressure, sugar level, heartbeat, lung and respiration information etc., which are used to evaluate the health condition of the patient. Social distancing is of key importance during the current pandemic.

It helps limit the spread of covid by observing distance between disease spreading individuals. Now it is not possible to station a person 24×7 at each queue to monitor social distancing violations. Banks, Public Offices, Malls, Schools, Theatres etc usually see long queues for hours every day.

5. SYSTEM DESIGN AND IMPLEMENTATION

The Circuit Diagram of the system is shown in Fig 1.

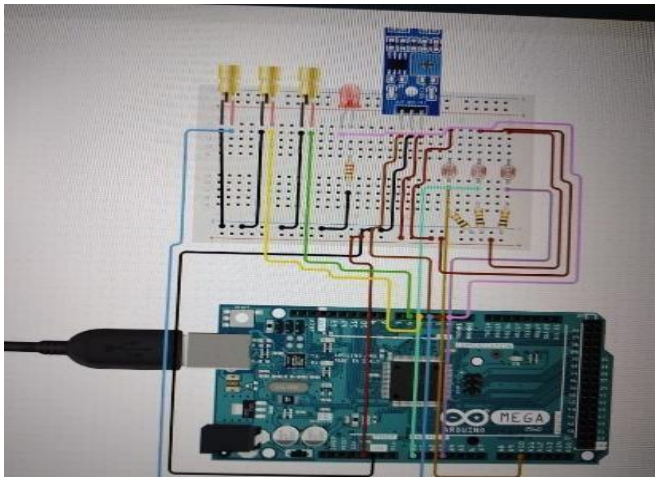
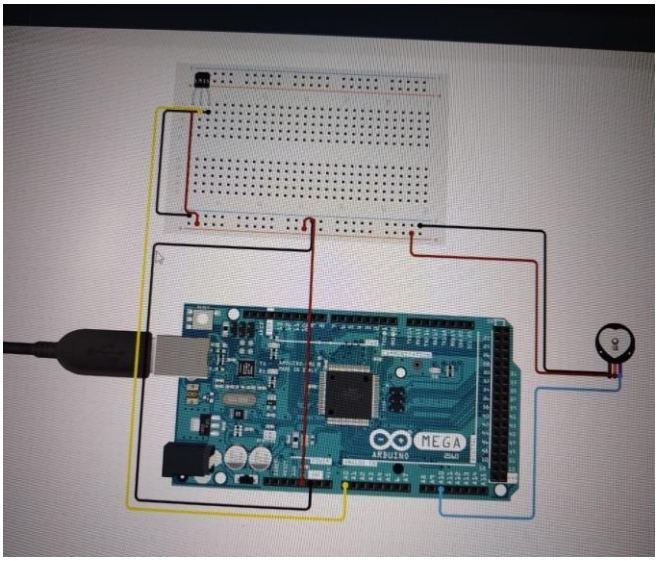


FIG 1 Covid Testing Booth and social distance monitoring
FIG 2 Patient Health Monitoring system



6. HARDWARE IMPLEMENTATION

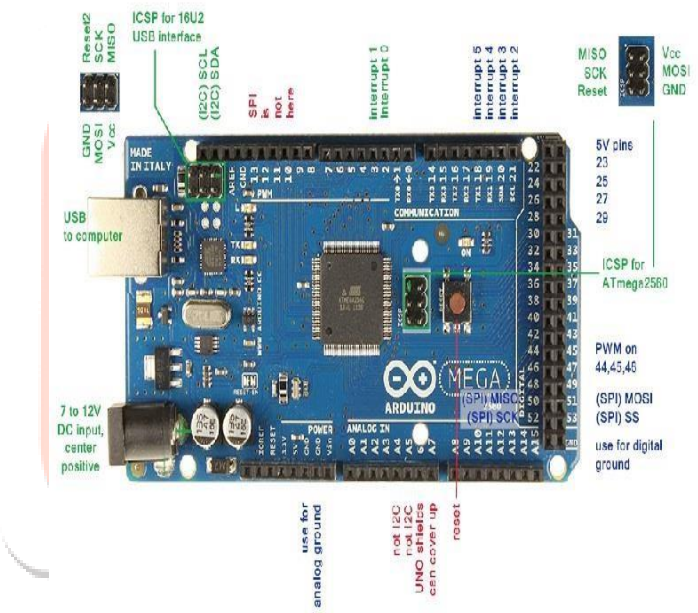


FIG 3 Arduino-mega 2560-board-pin-diagram

The programming of an Arduino Mega 2560 can be done with the help of an IDE (Arduino Software), and it supports C-programming language. Here the sketch is the code in the software which is burned within the software and then moved to the Arduino board using a USB cable.

7. SOFTWARE IMPLEMENTATION

The Module is Controlled by the cloud server. There are many cloud servers that supports https protocol.

RESULTS

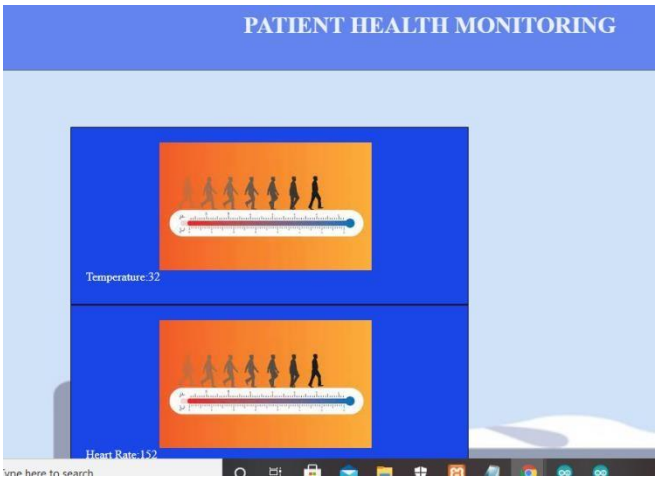


FIG 4 Patient Health Monitoring

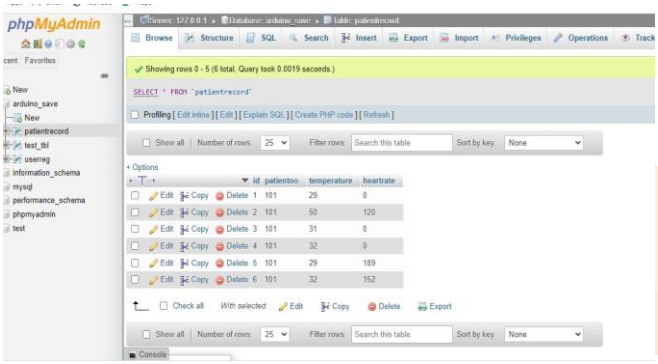


FIG 5 Patient Report

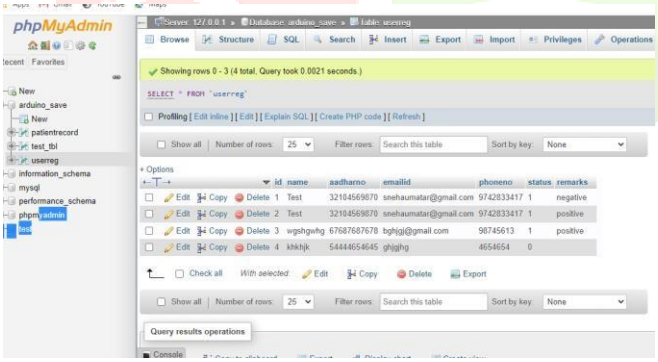


FIG 6 Covid-19 Test Report

FUTURE SCOPE

According to the availability of sensors or development in biomedical trend more parameter can be sensed and monitored which will drastically improve the efficiency of the wireless monitoring system in biomedical field. A graphical LCD can be used to display a graph of rate of change of health parameters over time. The whole health monitoring system which we have framed can be integrated into a small compact unit as small as a cell phone or a wrist watch. This will help the patients to easily carry this device with them wherever they go. In addition, with medical application we can use our system in industrial and agricultural application by using sensors like humidity sensors, fertility check sensors, etc. As well as for testing booth the Aadhaar details can be accessed so that by scanning the person image will get the complete details which again reduces the human interference of manually entering the details.

CONCLUSION

In this review, the use of IoT in health monitoring systems has been summarized. Although IoT is being used in all sectors of medical science, there is room for further improvement and research. The early identification of any health problem can help the patient to take necessary emergency measures, which can potentially save the patient's life. IoT can help in this regard. IoT based health monitoring systems can monitor the patients in real-time and warn the patient of any abnormalities. However, the IoT architecture must have the facilities to ensure the proper security of sensitive data. Also, the used sensors must be small in size so that they can be easily incorporated into various systems. Finally, the use of various machine learning and deep learning algorithms might make the systems more accurate and robust. The idea of a smart health monitoring system using the IoT architectures is a novel contribution in the field of medical science and it will reduce health issues and unwanted deaths. Testing booth and social distancing made human work easy as their will be no much interference and the queue is maintained easily as well as the user not to worry about the position to be hold on for standing and easily will get to know about next turn.

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