

Internet Of Thing Based COVID Testing Booth

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Abstract— In view of current situation the COVID-19 has become ubiquitous in every corner of the world. Every individual need to be cautious to overcome the spread of the COVID-19. It has become necessary to predict the COVID symptoms in order to allow the people at the public places and the entrances. The early symptoms of COVID-19 is high body temperature and change in pulses. It would be difficult to check temperature and take pulses of everyone, there might be a chance of being in contact with the person which is harmful. An automatic temperature scanning gate is presented to verify the body temperature and check pulses of any intruder. The main objective of the system is to monitor the human body temperature and take pulses when needed. In normal situation the gate is closed. If the module senses any high temperature (more than 37 degree Celsius) or the pulses are irregular, buzzer is activated indicating the detection of COVID symptom. Otherwise, the gate is opened, thus allowing the person into the room. The LCD displays the persons temperature and heart rate, being detected by sensor. In this project an attempt will be made to develop a prototype for covid testing booth for COVID 19 safety.

Keywords: Raspberry pi, Proteus Simulation, and Temperature detection.

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1. Introduction

In the early months of the COVID-19 pandemic with no designated cure or vaccine, the only way to break the infection chain is self-isolation and maintaining the physical distancing. In this paper, we present a potential application of the Internet of Things (IOT) in healthcare and physical distance monitoring for pandemic situations. The proposed framework consists of three parts: a lightweight and low-cost IOT node, a smart phone application (app), and fog-based Machine Learning (ML) tools for data analysis and diagnosis [1]. As the population increases, there is also an increase in the number of chronic and heart diseases. The current hospital centric healthcare system is becoming inefficient to treat conditions that demand immediate treatment such as heart strokes [2].

Health has become one of the global challenges for humanity. Cardiac diseases, Lung failures and heart related diseases are increasing at a rapid rate. Monitoring health of elderly people at home or patients at hospitals is necessary but it requires constant observation of Practitioners and Doctors. Information Technology (IT) and its growing applications are performing major role in making human life easier. Internet of Things (IOT) is transforming healthcare and the role of IT in healthcare [3].

Now-a-days health problems like cardiac failure, lung failures heart related diseases are arising day by day at a very high rate. Due to these problems time to time health monitoring is very essential. A modern concept is health monitoring of a patient wirelessly. It is a major development in medical arena. Thus paper based on the monitoring of the patient that is done by the doctor continuously

without actually visiting the patient. Health professionals have developed a brilliant and inexpensive health monitoring system for providing more comfortable living to the people suffering from various diseases using leading technologies like wire- less communications, wearable and portable remote health monitoring device. As a result, visits of doctors to the patients constantly are decreased as the information regarding patient's health directly reaches to doctor's monitor screen from anywhere the patient resides[4].

Our daily life is tough and full of problems, one of the most difficult task for this generation is to stay healthy. This can be achieved by inducing state of the art health monitoring system. Our aim is to provide affordable and effective solution of monitoring patient's health from anywhere in the world. In this paper, Raspberry Pi and Internet of Things (IOT) are used [5]. Raspberry Pi is interfaced with multiple sensory sources that provide continuous data and limits the human error [6].

2. Raspberry Pi based Temperature Measurement

An IOT (Internet of Things) based COVID-19 testing booth is a device that uses sensors and connected devices to automate the process of COVID-19 testing. Sensors can be used to measure body temperature, monitor respiratory rates and detect other symptoms associated with COVID-19. The booth can store and analyze test results, allowing health officials to track and monitor outbreaks. The booth can be connected to the internet, enabling remote monitoring and management. The booth can be designed to minimize physical contact, reducing the risk of transmission.

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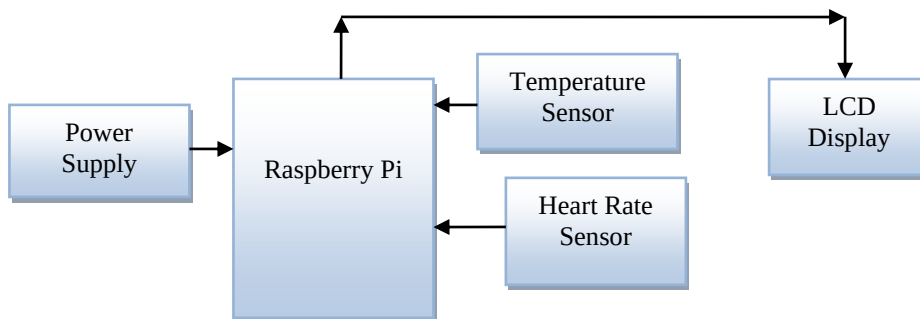


Figure 1. Basic Block Diagram

2.1 Heart Beat Sensor

A heart beat sensor is a device that is used to monitor the heart rate or pulse of a person. It works by detecting changes in the blood flow through the arteries and converting those changes into an electrical signal. This signal is then used to measure the heart rate. Heart beat sensors are commonly used in fitness and health monitoring devices, such as wearable fitness trackers and smart watches [7]. They can also be used in medical equipment, such as heart monitors and defibrillators, to provide critical information to healthcare professionals.

There are two main types of heart beat sensors: optical sensors and electrical sensors [8]. Optical sensors use light to detect changes in blood flow, while electrical sensors use electrical signals to measure the heart rate. Heart beat sensors are a valuable tool for monitoring heart health, as they can provide early warning signs of conditions such as heart disease, heart attacks, and arrhythmias. They can also be used to monitor the effects of exercise, stress, and other factors on heart rate.

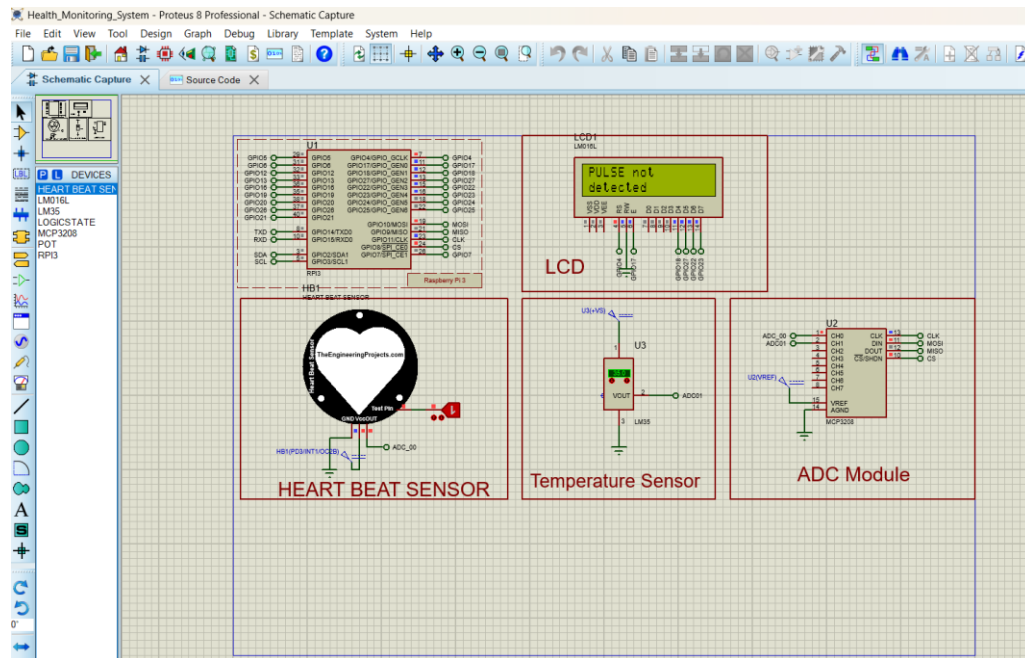


Figure 2. Pulse not Detected

Proteus software is a simulation and PCB (Printed Circuit Board) design tool that can be used to develop and test electronic circuits and devices. In the context of health monitoring, Proteus can be used to design and simulate various health monitoring systems, such as:

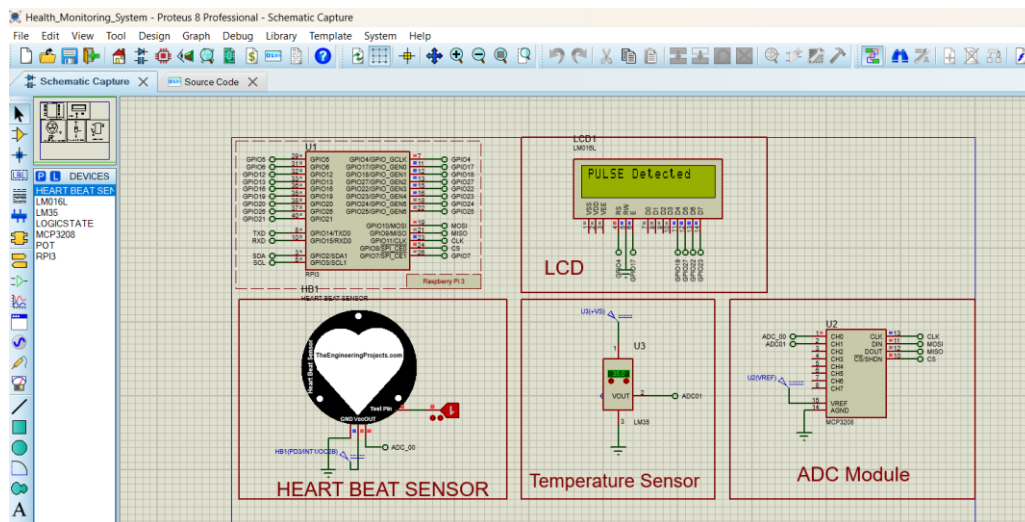


Figure 3. Pulse Detected in LCD panel

Heart rate monitoring: Proteus can be used to simulate the interface between a heart rate sensor and a microcontroller, allowing developers to test and optimize the performance of their heart rate monitoring systems. Proteus can be used to simulate the interaction between a temperature sensor and a microcontroller, enabling developers to test and refine their temperature monitoring systems. Proteus can be used to simulate the interaction between a sleep monitoring device and a microcontroller, allowing developers to test and refine the performance of their sleep monitoring systems. Proteus can be used to simulate the interface between a blood pressure sensor and a microcontroller, enabling developers to test and refine the performance of their blood pressure monitoring systems. Figure 3 and 4 represents the pulse not detected and after detection which is shown in LCD.

By using Proteus, developers can save time and reduce costs by identifying and fixing design issues early in the development process, before moving on to prototyping and manufacturing. In this way, Proteus can play an important role in the development of effective and reliable health monitoring systems. In IOT security also required to use safely [9] and different applications of IOT is possible in different applications like road safety [10].

2.2 LM35 Temperature Sensor

The LM35 temperature sensor is useful because it provides a simple and accurate way to measure temperature [11]. The sensor works by converting temperature into an electrical signal that can be easily read by a microcontroller or other device. Some benefits of using the LM35 temperature sensor include:

It is accurate to within $\pm 1^{\circ}\text{C}$, making it ideal for applications that require precise temperature measurements. Also provides a linear output that is proportional to the temperature, making it easy to convert the electrical signal into a temperature reading. The LM35 can measure temperatures from -55°C to 150°C , making it suitable for a variety of applications. Compared to other temperature sensors, the LM35 is relatively low cost, making it an attractive option for budget-conscious applications. The LM35 is easy to interface with microcontrollers and other devices, and requires no external components, making it a simple and convenient choice for many projects.

3. Result and Discussion

The ADC (Analog-to-Digital Converter) module and LCD (Liquid Crystal Display) device are two key components that can be used to develop a health monitoring system. The ADC module is used to convert the analog signals from sensors into digital signals that can be processed by a microcontroller or other device. In a health monitoring system, the ADC module can be used to convert signals from sensors such as heart rate monitors, temperature sensors, and blood pressure monitors into digital signals that can be used to track and monitor health data. The LCD display device can be used to display the health data collected by the sensors. This provides a convenient way for users to monitor their health data and make informed decisions about their health and wellness. The LCD display can also be used to display other information, such as time, date, and battery life, making it a versatile component for health monitoring systems. Figure 4 shows the exact result after simulation.

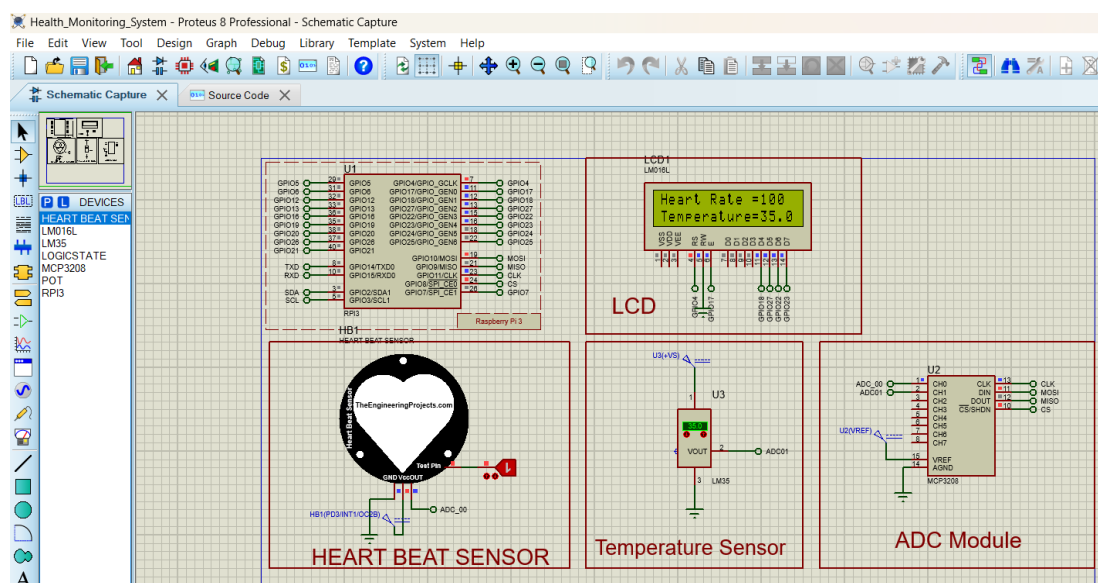


Figure 4. Proteus Simulation result on LCD

Together, the ADC module and LCD display device can be used to develop a comprehensive and user-friendly health monitoring system. By converting analog signals from sensors into digital signals and displaying them on an LCD screen, these two components can help users to track and monitor their health data more effectively and make more informed decisions about their health and wellness.

4. Conclusion

Raspberry Pi is a popular platform for building health monitoring systems because it offers several benefits, including affordable, flexibility, versatility, open source and good computing power. Raspberry Pi is an inexpensive and accessible platform, making it an ideal choice for those who want to build a health monitoring system on a budget. Raspberry Pi is a highly flexible platform that can be used to build a wide range of health monitoring systems, from basic systems that track heart rate and body temperature to more advanced systems that track multiple health metrics. Raspberry Pi can be used with a variety of sensors and actuators, making it possible to build health monitoring systems that are tailored to specific needs and requirements. Raspberry Pi runs on open-source software, making it easy to customize and modify the system to meet specific needs. This also makes it easy for developers to share and collaborate on projects, increasing the potential for innovation and progress. Raspberry Pi is a powerful platform that can handle complex computations and data processing, making it well-suited to health monitoring systems that require real-time analysis of health data.

The project covid booth is designing automated instant contactless COVID testing booth system by which person details are monitored. The data collected by the time is transferred to the mail to the respective person by the system itself. For testing the covid symptoms. For healthcare system. Industries Covid booth. Monitoring device that could be used to detect the heart beat anomalies of physically challenged Individuals without hands. Also a graphical LCD can be used to display a graph of the change of heart rate over time.

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