IOT Based Thermal Screening using Raspberry Pi

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Abstract: *There are lots of IoT devices now days to monitor the temperature of patient over internet. Health experts are also taking advantage of these smart devices to keep an eye on their patients. With tons of new healthcare technology start-ups, IoT is rapidly revolutionizing the healthcare industry. Here in this project, we will make an IoT based thermal screening using raspberry pi. Is The Internet of Things (IoT) defines that objects are interconnected through wired and wireless networks without user intervention. MLX90614 is a contactless IR temperature sensor. It states that everybody radiates IR radiation proportional to its temperature. This radiation is then measured through the sensor converted to a digital signal and is communicated through the I2C bus and also the body temperature readings are recorded over ThingSpeak.*

Keywords: Raspberry Pi, IoT, MLX90614 temperature Sensor

I. INTRODUCTION

Health monitoring is the major problem in today's world. Due to lack of proper health monitoring, patient suffer from serious health issues. There are lots of IoT devices now days to monitor the health of patient over internet. Health experts are also taking advantage of these smart devices to keep an eye on their patients. With tons of new healthcare technology start-ups, IoT is rapidly revolutionizing the healthcare industry. IOT is rapidly revolutionizing the healthcare industry.

In this project, we have designed the IOT Based Patient Health Monitoring. In recent, we are suffering from covid-19 virus because of that the government announced lockdown, and so we can't go outside. But after some days they announced unlock of some place but the people with following the rules of proper thermal screening and social distancing. It will help to the guard to find is any symptomatic person found before entering in hall or any places. So, we can decrease the spread of Covid-19. The IOT platform used in this project is Thing Speak.

II. LITERATURE SURVEY

An IOT based patient monitoring system using RASPBERRY PI

This project was published by R. Kumar, Dr. M. Pallikonda Rajasekaran Methodology: Software-Linux. Result: In future after adding raspberry pi MAC address and program to website and proper internet connection it will act as server.

GSM based Health Care Monitoring System:

Author and Year of publication: M. Babu Prasad (December 2018) Methodology: Software-Any Hardware-Temperature sensor, GSM module, PIC controller, Heartbeat sensor, RS232 module, keypad, LCD display. Result: The quick, accuracy and real time environment methodology imposed in the system.

AD8232 based Smart Healthcare System using Internet of Things (IOT)

Author and Year of publication: Ayaskanta Mishra1, Biswarup Chakraborty2 (April 2018) Methodology: Software-Linux Hardware-Raspberry pi, pulse rate sensor, heart sound sensor, blood pressure sensor, pi. Result: The proposed system gives the better and efficient healthcare services to patient.

III. OBJECTIVE

1. To design of block diagram and selection of components.
2. To simulate the circuit diagram to get expected outcome.
3. To develop software code to get the desire functioning.
4. To implement and testing of hardware and software.
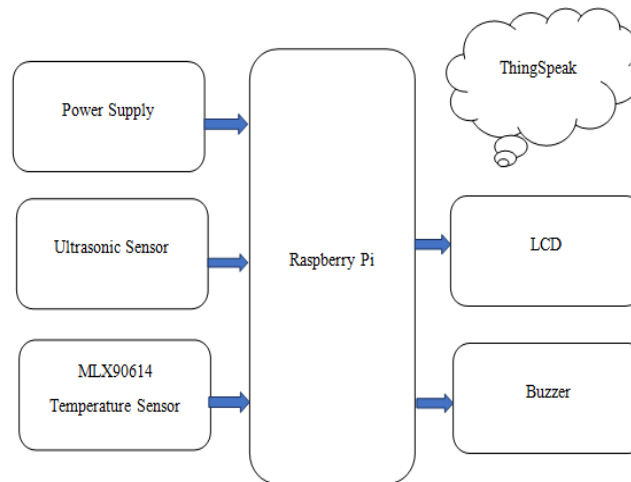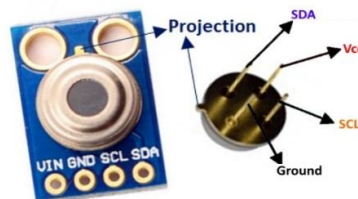
IV. METHODOLOGY

Fig.1 Block Diagram

IoT based thermal screening using Raspberry Pi

The above Fig.1 shows the block diagram of our project. Firstly, ultrasonic sensor will sense the human is present or not if human is present then the mlx90614 temperature sensor send the human body temperature and pass it to the thing speak cloud and also to the LCD screen according to temperature the message will display on LCD screen. If temperature is less than 38/39 the screen message is normal temperature and if it is greater than that it shows the temperature is not normal please don't go inside. The temperature is also stored in the thing speak cloud; in that we can see the graph of temperature.
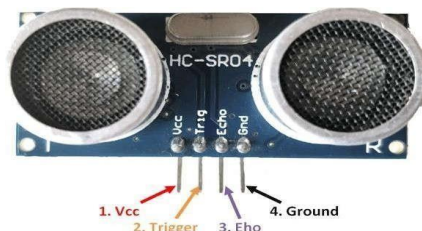
V. HARDWARE COMPONENTS

5.1 MLX90614: Temperature Sensor

The MLX90614 is a **Contactless Infrared (IR) Digital Temperature Sensor** that can be used to measure the temperature of a particular object ranging from -70° C to 382.2°C. The sensor uses IR rays to measure the temperature of the object without any physical contact and communicates to the microcontroller using the I2C protocol. The key feature of MLX90614 is that it is a contactless IR temperature sensor with high accuracy. So it can be used in industries to **measure the temperature of moving objects** like a rotating motor shaft. Due to its high accuracy and precision, it is also used in a wide range of **commercial, health care, and household applications** like room temperature monitoring, body temperature measurement, etc.
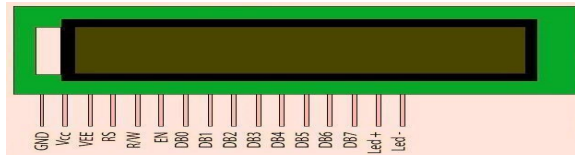
5.2 Ultrasonic Sensor

The HC-SR04 Ultrasonic (US) sensor is a 4 pin device, whose pin names are Vcc, Trigger, Echo and Ground respectively. This sensor is a very popular sensor used in many applications where measuring distance or sensing object required. The module has two eyes like projects in the front which forms the Ultrasonic transmitter and Receiver. The sensor works with the simple high school formula that.
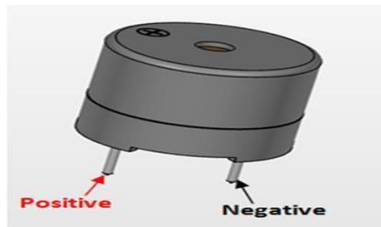
Distance = Speed × Time

5.3 LCD Display

LCD means "Liquid Crystal Display". Here LCD used is 16X2. 16X2 means LCD has16 columns and 2 rows. Each row is able to print 16 characters. It operates at 4.7V to 5.3 V. Current consumption of it is 1mA without backlight. It is available in green and blue backlight tLiquid crystal display technology works by blocking light. At the same time, electrical currents cause the liquid crystal molecules to align to allow varying levels of light to pass through to the second substrate and create the colors and images.

5.4 RASPBERY PI

The Raspberry Pi is a low cost, **credit-card sized computer** that plugs into a computer monitor or TV, and uses a standard keyboard and mouse. It is a capable little device that enables people of all ages to explore computing, and to learn how to program in languages like Scratch and Python. It's capable of doing everything you'd expect a desktop computer to do, from browsing the internet and playing high-definition video, to making spreadsheets, word-processing, and playing games. What's more, the Raspberry Pi has the ability to interact with the outside world, and has been used in a wide array of digital maker projects, from music machines and parent detectors to weather stations and tweeting birdhouses with infra-red cameras.
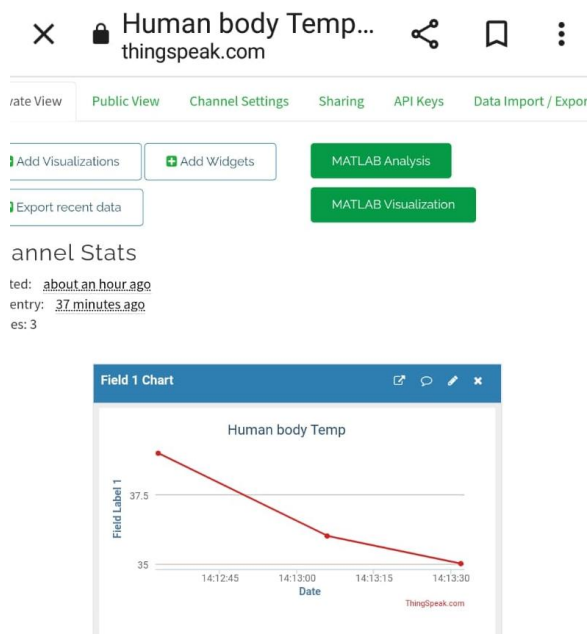
5.5 BUZZER

Buzzers are electric sounding devices that generate sounds. Typically powered by DC voltage, they can be categorized as Piezo buzzer and magnetic buzzer. They come in different designs and uses as well, and based on that, they can produce different sounds. A buzze**r** or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric (piezo for short). Typical uses of **buzzers** and beepers include alarm devices, timers, and confirmation of user input such as a mouse click orkeystroke.

V. APPLICATIONS

The IOT Based thermal screening using raspberry Pi designed here can be used in different public areas such as:

1. Schools/Colleges.
2. Railway Stations.
3. Airports.
4. Big Hospitals.
5. Fruit Markets.
6. Famous Temples
7. Industries

VI. RESULT

A. First Output of Project on LCD

B. Second Output of Project on LCD

C. Output of Project on Screen

D. Third Output of Project on LCD

E. Output of Project on Thing speak

VII. CONCLUSION

The purpose of the system has been designed for remote health monitoring system. This project work in the place of human at the entrances that in this we save the life of one human.

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